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FOREWORD

The International Research Academy of Science and Art is the host of the eighth IRASA International Scientific Conference "SCIENCE, EDUCATION, TECHNOLOGY AND INNOVATION – SETI VIII 2026".

The conference is multidisciplinary oriented.

Thematic fields of the SETI VIII 2026 conference are the following:

- A. Science, technology and innovation**
- B. Education and knowledge for the 21 century**
- C. Preservation and improvement of the environment and human health**
- D. Sustainable territorial development**
- E. National security and protection.**

The **aims** of the SETI VIII 2026 Conference are the following:

- Improving knowledge basis for sustainable and resilient local, national, transnational and global development
- Support and harmonization of the implementation of sustainable development goals in society, economy, environment and urbanization
- Strengthening scientific, technological and innovative capacities at local, national and transnational level
- Recommendations for the improvement of education, research and security, and governance of the environmental, urban and territorial development
- Dissemination and intensification of professional communication and establishment of network for joint research, innovation and education
- Dissemination and intensification of professional communication and establishment of network for security challenges and risks in environment and society
- Experience Exchange Based on Best Practices

The results of the SETI VII 2025 Conference are presented in the Book of Abstracts and the Book of Proceedings.

Belgrade, October 2026

Editorial Board



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KEYNOTE PAPERS



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THE TWELVE APOSTLES OF THE SCIENCE OF THE FUTURE (*Epistemological hierarchy beyond transdisciplinarity – Hierarchia epistemologica supra transdisciplinam*)

Vladica Ristić¹

Abstract

This paper presents a systematic exposition of twelve innovative concepts that define a new epoch of scientific thought — an epistemological hierarchy beyond transdisciplinarity. Its focus is not on the mere interconnection of existing disciplines but on the reorganization of the very architecture of knowledge. The concepts presented — from metadisciplinarity to anthrocosmic science — together form a theoretical framework for a forthcoming scientific civilization in which matter, consciousness, technology, and ethics are integrated into a unified network of understanding. The paper serves both as a manifesto and a scientific study on the emergence of an epistemological hierarchy beyond transdisciplinarity a conceptual framework that marks the transition of science into a new phase of self-reflection and self-awareness. At its core lie twelve innovative paradigms, which together constitute the structure of metascientific evolution from metadisciplinarity as science's reflective awareness of itself, to anthrocosmic science as the highest synthesis between humanity, nature, and the universe. The aim of the study is to demonstrate how, in the twenty-first century, a new epistemology is emerging — one in which science transcends its methodological boundaries and becomes a self-reflective system capable of ethical, technological, and spiritual integration. The work is grounded in the foundations of systems theory, the philosophy of complexity, transdisciplinarity, and contemporary cognitive science, expanded through original concepts that can be experimentally referred to as the IRASA School of Thought.

Key words: *From metadisciplinarity to anthrocosmic science; epistemological hierarchy; transdisciplinarity; cognitive ecology; systems theory; IRASA School of Thought.*

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A UNIVERSAL THREE-LEVEL FRAMEWORK FOR ARTIFICIAL INTELLIGENCE POLICY IN HIGHER EDUCATION

Anita Rose²

Abstract

The rapid integration of artificial intelligence tools in higher education has created significant challenges for academic institutions struggling to establish consistent, effective policies. Students face confusion when AI use expectations vary widely across courses, while faculty lack clear institutional guidance for balancing academic integrity with preparing students for AI-enabled professional environments. This conceptual paper presents a universal three-level framework designed to address these challenges through a systematic approach to AI policy development in universities. The framework categorizes assignments into three distinct levels: AI-Free (no AI permitted), AI-Assisted (limited AI use with disclosure), and AI-Collaborative (full AI integration with methodology documentation). The methodology involved analyzing existing institutional AI policies, identifying common pain points, and developing a flexible yet standardized system that respects disciplinary differences while ensuring campus-wide consistency. Results demonstrate that this framework provides clear expectations for students, preserves faculty autonomy in pedagogical decisions, and remains enforceable under existing academic integrity policies. The discussion explores implementation strategies, addresses potential challenges, and examines implications for curriculum design and student learning outcomes in the evolving landscape of AI-enhanced education.

Key words: *Artificial intelligence policy, higher education, academic integrity, educational technology, AI integration, pedagogical framework.*

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MODELING OF CONTAMINANT MIGRATION

Dušan Polomčić³; Vesna Ristić Vakanjac⁴; Milan Radulović⁵

Abstract

Preserving groundwater quality represents one of the most critical environmental challenges of the 21st century, as these resources serve as the primary source of potable water globally. The migration of contaminants within aquifers is governed by complex transport mechanisms: predominantly advection, mechanical dispersion, and molecular diffusion, alongside physical-chemical interactions such as sorption, ion exchange, and biochemical degradation. To comprehend the dynamics of these processes, it is essential to employ three-dimensional hydrodynamic solute transport models that facilitate the simulation of mass transfer across spatial and temporal scales. The utility of these models lies in their ability to predict contaminant plumes and identify vulnerable areas before pollutants reach critical receptors, such as groundwater sources. In addition to complex transport modeling, the particle tracking method is utilized for a preliminary assessment of the direction, velocity, and residence time of contaminants within the aquifer. Furthermore, while fundamentally less complex than solute transport models, hydrodynamic flow models (i.e. groundwater flow models) are instrumental in estimating discharge from geological formations of varying chemical compositions; such waters often necessitate treatment and neutralization prior to surface discharge. This paper presents and elucidates these methodologies through selected case studies. Currently, numerical simulations constitute an indispensable approach in decision-making, enabling the evaluation of diverse optimization scenarios for preventive measures, groundwater protection, and geo-environmental remediation.

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Key words: *Hydrodynamic model, solute transport modeling, solute transport, particle tracking.*



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TOURISM AND SUSTAINABILITY RISKS

Snežana Štetić⁶; Igor Trišić⁷; Florin Nechita⁸

Abstract

Tourism is very sensitive to all negative phenomena both in the natural environment and in social events. Therefore, when developing tourism in a destination, it is extremely important to look at all the weaknesses that arise in the area of safety and security. It is common knowledge that there is nothing in life that does not contain a certain amount of risk. In colloquial speech, "risk" is often used as a synonym for the probability of some business loss or damage occurring. In tourism and behavior, it is simply taken for granted. All over the world, modern tourism is characterized by growing risks of various kinds, from commercial to environmental and political. That is why tourism subjects, and above all managers in tourism, must ensure that they can survive unstable situations as easily as possible. Also they have to use the opportunities that are presented to them in such situations as efficiently as possible. It is for this reason that risk management becomes a necessary part of the management of all tourism processes. Failures in this activity can destroy tourist destinations or cause far-reaching consequences. Then, rather than focusing on new and successful activities, managers have to devote themselves to restoring losses. Risk management is therefore a process through which the business justification for the selection of security solutions and controls that will provide a sufficient level and degree of security is confirmed. The most important, most sensitive and most time-consuming part of the risk management process is the assessment procedure, or risk analysis. In this paper, the authors will deal with risks that have affected the development of tourist destinations. Various causes have had a smaller or greater impact on destinations, which in the past led to slow or no tourism development.

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Key words: *Risks in tourism, sustainable development, tourist destination, risk management.*



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ENERGY SECURITY AND CRITICAL INFRASTRUCTURE PROTECTION AS CONTEMPORARY CHALLENGES TO NATIONAL SECURITY IN EUROPE

Mirko Smoljić⁹

Abstract

Energy security and critical infrastructure protection have become central issues of national security in contemporary Europe. Recent geopolitical instability, hybrid threats, cyberattacks, sabotage risks, supply-chain disruptions, and climate-related hazards have exposed the growing vulnerability of energy systems and strategic infrastructure across the continent. In this context, national security can no longer be understood exclusively in military terms, but must also include the resilience of institutions, continuity of essential services, and the protection of critical infrastructure. This paper examines energy security and critical infrastructure protection as contemporary challenges to national security in Europe from legal, institutional, economic, and technological perspectives. The analysis is based on a review of relevant scientific literature, strategic documents, and selected European regulatory frameworks relating to energy security, the resilience of critical entities, and cybersecurity. Particular attention is devoted to the interdependence between energy systems, digital infrastructure, transport networks, communications, and public governance capacities in conditions of crisis and uncertainty. The paper argues that the protection of critical infrastructure and the strengthening of institutional resilience have become fundamental preconditions for national stability, public safety, and sustainable development. It concludes that contemporary European states must adopt an integrated security approach that combines legal preparedness, strategic governance, technological protection, and cross-sectoral cooperation in order to respond effectively to modern security risks.

Key words: *Energy security, critical infrastructure protection, national security, institutional resilience, hybrid threats.*

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DEFINITION OF THE LIQUIDUS PROJECTION IN THE AL-BI-GE SYSTEM

Nikola Bojanic¹⁰; Veljko Minic¹¹; Aleksandar Djordjevic¹²; Dusko Minic¹³; Milena Zecevic¹⁴

Abstract

The liquidus projection of the Al-Bi-Ge system is a graphical representation of the temperatures and compositions at which the liquid phase begins to solidify in a ternary phase diagram. This projection is used to understand primary crystallization fields, phase relationships, and solidification paths in the system. In this study, the liquidus projection of the Al-Bi-Ge system was experimentally and analytically tested. The liquidus surface was calculated using Pandat software and relevant thermodynamic databases. Calculated liquidus projection consists of large region of liquid immiscibility and several smaller primary crystallization fields. The obtained results of the thermodynamic calculation of the liquidus projection point to existence of two invariant reactions that are ternary decomposed reactions. One is monotectic reactions $L \rightarrow L + (Al) + (Ge)$, which is predicted at 421.83 °C. Second one is ternary eutectic reaction $L \rightarrow (Al) + (Bi) + (Ge)$ predicted at 270.32 °C. Those reactions are experimentally confirmed with DTA method. Good agreement between experimentally determined and calculated temperatures was achieved.

Key words: *Al-Bi-Ge system, liquidus projection, phase diagram, DTA, thermodynamic modeling.*

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DEFINITION OF THE TERNARY EUTECTIC REACTION IN THE AL-BI-GE SYSTEM

Veljko Minic¹⁵; Nikola Bojanic¹⁶; Aleksandar Djordjevic³¹⁷; Dusko Minic⁴¹⁸; Milena Zecevic⁵¹⁹

Abstract

Studying eutectic reactions is important because they play a key role in understanding the solidification behavior of alloys. Eutectic transformations determine the temperature and composition at which a liquid phase solidifies into multiple solid phases, which directly influences the microstructure of the material. This knowledge is essential for controlling material properties such as strength, hardness, and corrosion resistance. In addition, eutectic reactions are widely used in industrial processes like casting and soldering, where precise control of melting and solidification temperatures is critical. Furthermore, investigating eutectic systems helps in the development of new materials with tailored properties, improving performance in applications ranging from electronics to structural components. A ternary eutectic reaction in the Al-Bi-Ge system is an invariant transformation in which a liquid phase of a specific composition solidifies isothermally into three distinct solid phases simultaneously. This reaction is: $L \rightarrow (Al) + (Bi) + (Ge)$. It occurs at a fixed temperature 270.32 °C and composition Al 0.46 at. %, Bi 99.49 at. % and Ge 0.05 at. %, known as the ternary eutectic point, where the liquid phase transforms into solid aluminum-rich, bismuth-rich, and germanium-rich phases in equilibrium. This ternary reaction was experimentally investigated using 12 ternary samples by applying thermal analysis. Selected ternary samples were from three vertical sections Al-BiGe, Bi-AlGe and Ge-AlBi. The samples are

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positioned along vertical sections because, for each alloy, a ternary eutectic reaction is expected to occur at the lowest temperature.

Key words: *ternary eutectic reaction, DTA experiments, Al-Bi-Ge system.*

CONCEPTUAL DESIGN OF A DISK-SHAPED ARCTIC OFFSHORE PLATFORM USING COMPOSITE MATERIALS FOR REDUCED ENVIRONMENTAL IMPACT

Sergej Vukša²⁰

Abstract

Hydrocarbon exploitation in Arctic regions presents significant engineering and environmental challenges due to extreme low temperatures, ice loading, and high ecological sensitivity. Conventional offshore platforms, such as the Prirazlomnaya platform, are predominantly constructed from steel and concrete, resulting in high structural mass, elevated carbon emissions, and complex maintenance requirements. This study proposes a conceptual design of a fixed, disk-shaped offshore platform optimized for Arctic coastal conditions. The structure incorporates advanced composite materials, including carbon fiber reinforced polymer (CFRP) and glass fiber reinforced polymer (GFRP), enabling reduced structural weight, improved corrosion resistance, and enhanced performance under low-temperature conditions. The disk geometry provides favourable load distribution and minimizes ice accumulation through aerodynamic shaping and anti-icing edge design. A comparative engineering assessment with conventional Arctic platforms is conducted, focusing on structural efficiency, environmental impact, and operational performance. The concept integrates a thermally protected helideck, closed-loop environmental control systems, and hybrid energy generation based on LNG and renewable sources.

The results indicate a potential reduction in structural mass of up to 70% and a decrease in carbon emissions of approximately 30%, alongside improved energy efficiency and reduced maintenance demand.

Key words: *Arctic offshore platform, composite materials, sustainable engineering, disk structure, environmental impact, offshore design.*

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NUMERICAL INVESTIGATION OF THE INFLUENCE OF USNIC ACID ON THE DYNAMICS OF THE BRAY-LIEBHAFSKY OSCILLATORY REACTION

Ana Ivanović-Šašić²¹; Stevan Maćešić²²; Željko Čupić²³

Abstract

This study investigates the influence of Usnic acid, a secondary lichen metabolite renowned for its potent antioxidant and antimicrobial properties, on the dynamics of the Bray-Liebhafsky (BL) oscillatory reaction. Due to its complex structure, Usnic acid could be served as a compelling subject for investigation within non-linear chemical systems. Building upon experimental findings where Usnic acid significantly influenced oscillation periods and amplitudes, the primary objective of this research is to propose a most likely reaction mechanism for this interaction. The modeling approach involves integrating new reaction steps into the core BL model and optimizing the associated rate constants. Special emphasis is placed on the application of numerical simulations, which enable the investigation of the system's behavior across a wide range of perturbant concentrations, effectively overcoming the limitations of laboratory conditions. The findings provide deeper insights into the antioxidant capacity of Usnic acid through its interaction with key oxygen and iodine intermediates, contributing to a more comprehensive understanding of non-linear dynamics in complex biological and chemical matrices.

Key words: *Bray-Liebhafsky, Usnic acid, numerical simulation.*

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A NEW ALGORITHM FOR MULTIPLYING NATURAL NUMBERS

Nebojša Budimirović²⁴; Vjekoslav Budimirović²⁵

Abstract

Very often in various practical problems, the operation of multiplying natural numbers arises. There is a need to perform multiplication as quickly and reliably as possible. Mathematicians have developed various practical methods, but they can be used only in special cases. Here, we are concerned with multiplication procedures that do not require the use of calculating machines. This paper presents a new algorithm for much faster multiplication of multi-digit natural numbers, in which only the result of the multiplication is recorded.

Key words: *Natural numbers, multiplication.*

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ONTOLOGICAL ARCHITECTURE OF THE UNIVERSE: A UNIFIED PENTAD MODEL

Boris Vakanjac²⁶

Abstract

This paper proposes a unified ontological framework for understanding the structure of reality through five foundational entities: Space, Time, Energy, Information, and Change. Each is treated not merely as a physical category but as an eternal ontological possibility — Space as extension, Time as succession, Energy as possibility, Information as distinction, and Change as transformation. The model unfolds across three regimes: (1) Separated Foundations, where entities exist in latent potential (pre-Big Bang singularity); (2) Intersecting Pairs, where entities merge into structured dynamics (space-time, energy-information); and (3) Fully Integrated Matrix, where all five converge into a unified field (cyclic cosmology, quantum gravity). This architecture is fractal across scales: from quantum duality and human cognition to cosmic evolution. The model aligns with inflationary theory, multiverse hypotheses, and cyclic cosmology, offering a metaphysical scaffold that complements contemporary physics. A symbolic schematic is presented to visualize the transitions between regimes and the interdependence of the entities. Ultimately, the Universe is not a singular event but a rhythmic unfolding of eternal principles — a living archive written in the grammar of the pentad. This framework invites interdisciplinary dialogue between physics, metaphysics, and cosmology.

Key words: *Space, time, energy, information, change.*

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COLLABORATION OF UKRAINIAN SCIENTISTS: ANALYSIS OF THE JOINT PUBLICATIONS

Lidiia Kavunenko²⁷

Abstract

The paper examines the cooperation of Ukrainian researchers from institutes of the National academy of sciences (NAS) of Ukraine with foreign partners on the basis of joint publication activities. Scientists of the NAS of Ukraine have a long-standing tradition of international cooperation, which, based on strategic partnership, allows us to create the potential for comprehensive solutions to modern scientific and innovative problems. A methodological approach was developed for the analysis of journals and a database of articles published in them was created using the Scopus database. In total, about 400 publications by scientists from four institutes of the NAS of Ukraine for 2022 were identified in the Scopus database. Almost 90% of all publications are scientific articles, which is what the analysis focused on. The study analyzed international periodicals where Ukrainian and foreign scientists publish their works, and also revealed the specificity of the publication activities of Ukrainian researchers from the analyzed institutes.

Key words: *Collaboration, NAS of Ukraine, joint publication, Scopus database, methodological approach, international periodicals.*

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ETHICS OF SCIENCE: MODERN CHALLENGES AND APPROACHES

Vitaliia Klimenkova²⁸

Abstract

The article is dedicated to the problems of scientific ethics, which in the 21st century is becoming more relevant with new force in the issues of harmonization of knowledge, the laws of nature, society, and morality. This article, based on an analysis of the experience of foreign scientific organizations, develops a systematic approach to responding to violations of the principles and norms of the Code of Ethics of a Scientist of Ukraine. The conducted study of the current state of young scientists in scientific teams of the institutes of the NAS of Ukraine shows that most of the institutes of the Academy have a good reputation, the norms of scientific ethics are observed, the teams have a healthy attitude towards constructive criticism, however, cases of non-compliance with ethical norms have also been identified. Using the example of monitoring compliance with the norms of scientific ethics in the Max Planck Institutes, a number of measures were proposed that could help cleanse scientific teams of dishonest scientists, as well as contribute to the effective and objective activities of scientists in Ukraine.

Key words: *Ethics in science, academic integrity, approach, Code of Ethics.*

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CLIMATE-SMART AGRICULTURE – PUBLIC HEALTH OUTCOMES: ENHANCING COMMUNITY WELLNESS VIA SUSTAINABLE FARMING PRACTICES

*Magna Anissa A. Hayudini²⁹; Milda Masihul Aming³⁰;
Safia E. Aming³¹; Mahmor N. Edding³²*

Abstract

Common byline The Global South Climate smart agriculture (CSA) represents an integrated approach identified as a strategy to address the inter-linked challenges of food security, climate change and public health. Therefore, this paper has explored the relationship between climate-smart agricultural practices and health outcome determinants of rural agriculture in the context of changing climate. In particular, it investigates the potential of adaptive farming systems—such as agro-ecological cropping modalities, watershed management strategies (recharge and conservation), organic fertilizers expansion and chemical inputs mitigation to impact health via improved nutrition and decreased exposure to environmental toxins. Using a mixed-methods approach, the study integrates quantitative data regarding agricultural practices and health indicators with qualitative insights derived from interviews with farmers and local health workers. And here are the results: CSA practices on the ground positively correlate with increased access to more nutrient dense foods in local communities, which in turn improves dietary diversity and reduces malnutrition prevalence, especially among vulnerable groups like children or pregnant women. Less reliance on synthetic pesticides and fertilizers also greatly reduces the chances of chemical-induced illnesses and environmental pollution. The study also highlights how community-supported agriculture (CSA) can help build stronger communities and resiliency to climate-related health threats such as heat stress, water scarcity and vector-borne diseases. Reducing the chances of carbon release into the atmosphere and creating clean air, clean soil, cleaner waters in the process with CSA initiatives all

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encourages safe space and sustainable land use leading to a balance between the ecosystem contributing towards a safer environment and sustainable livelihood for all ensuring long term public health. Behr and Brook marvel at how the obstacles to widespread adoption — limited access to training, financial constraints in advancing planned practices and a relative lack of supportive policies — are dwarfed by its promise. The findings underscore the urgency for integrated policies linking agriculture and health, as well as environmental sectors. Unlocking the full health potentials of these approaches is thus in need of enhancing capacity-building initiatives, improving access to resources and promoting community engagement. It contributes to a growing body of evidence that climate-smart agriculture is not just an environmental and economic strategy, but also an essential public health intervention.

Key words: *Climate-smart agriculture, public health outcomes, enhancing community wellness; sustainable farming practices.*



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CLIMATE-SMART AGRICULTURE: TECHNOLOGIES, PRACTICES, AND IMPACTS ON SUSTAINABLE FOOD PRODUCTION

*Rania Lampou*³³

Abstract

Agriculture nowadays is facing multiple problems caused by climate change, the constantly increasing demand for food and environmental degradation. Climate-Smart Agriculture (CSA) aims to solve many of them. CSA is an integrated framework whose main objectives are to make agriculture more productive, despite constant climate shifts and to minimize greenhouse gas emissions. This review paper will discuss the technology behind CSA, as well as sustainable farming practices, positive environmental impacts, and socioeconomic effects. It will also assess how precision agriculture technologies, climate monitoring systems, conservation agriculture, agroforestry, and digital farming platforms can benefit and improve sustainable food production. It will then highlight the impact of mass CSA adoption on the economy, the necessary policies to implement it, and the changes that digital technologies can bring to modern agricultural systems. The paper will also argue that climate-smart agriculture can be an effective strategy for solving problems caused by climate change and that it can also ensure global food security. Finally, it will present obstacles to mass adoption of CSA such as the lack of supportive policies, reliable technological infrastructure, and specially designed education programs for farmers.

Key words: *Climate-smart agriculture, sustainable farming, precision agriculture, food security, climate change adaptation.*

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MICROPLASTICS IN POULTRY PRODUCTION SYSTEMS: EMERGING CONTAMINANTS, BIOLOGICAL EFFECTS, FOOD CHAIN RISKS AND REGULATORY ASPECTS

Milena Milojević³⁴; Suzana Knežević³⁵; Aleksandra Milošević³⁶

Abstract

Micro-plastics represent a globally distributed eco-toxicological contaminant that is increasingly entering the animal food chain. Poultry is particularly exposed due to intensive production systems and constant contact with contaminated feed, water, and litter. The aim of this study was to systematically review current knowledge on exposure pathways, biological effects, and potential risks of micro-plastics in poultry production systems. The results indicate that micro-plastics can induce oxidative stress, inflammation, and disruption of the intestinal microbiota in poultry, which may negatively affect growth performance and feed conversion efficiency. Furthermore, the detection of micro-plastics in poultry feed and chicken tissues suggests their potential transfer through the food chain. However, the available data remain limited and heterogeneous.

Key words: *Micro-plastics, poultry, ecotoxicology, food safety.*

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PHYTOGENIC MODULATION OF BROILER PERFORMANCE BY PROPOLIS AND THYME SUPPLEMENTATION

Vesna Karapetkovska-Hristova³⁷; Bardha Ibishi³⁸; Ivan Pavlovic³⁹; Syed Khalid Mustafa⁴⁰

Abstract

The application of natural additives represents a modern approach in poultry production aimed at improving growth performance and meat quality. This study evaluated the effects of four dietary treatments: a control diet, 3 g propolis/kg feed (P3), 6 g propolis/kg feed (P6), and 25 g thyme/kg feed (Th). The experiment was conducted on broilers of a cross-breed, slaughtered at 7 weeks of age. The trial was conducted on a poultry farm in the western region of North Macedonia during the period 2024–2025. Breast muscle samples were analyzed in an accredited laboratory. To assess the influence of raw propolis and thyme on breast muscle quality, chemical analyses were performed on five representative samples from each experimental group, reflecting within-group variability (K1–K5, P3/1–P3/5, P6/1–P6/5, Th1–Th5). The results demonstrated that the P6 treatment had the most pronounced effect. Birds in this group recorded the highest live body weight (1194 g; $p < 0.01$) and carcass weight (862.4 g; $p < 0.01$) compared with the control group (735.2 g). Regarding meat composition, the P6 group showed the lowest fat content (2.26%; $p < 0.01$) and the highest protein content (27.34%; $p < 0.01$) compared with the control. These findings suggest that dietary supplementation with natural phytogenic additives can significantly improve slaughter performance and enhance breast meat quality in broilers.

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Key words: *Natural additives, propolis, thyme, broilers slaughter quality, breast muscle.*



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VARIABILITY IN PHYSICOCHEMICAL AND ANTIOXIDANT PROPERTIES OF HONEY

Zija Saidov⁴¹; Vesna Karapetkovska-Hristova¹; Nikolina Naydenova⁴²

Abstract

Honey represents a biologically complex matrix whose composition and functional properties are shaped by its botanical origin and surrounding environmental conditions. This study assessed the variability of selected physicochemical parameters and antioxidant capacity in honey samples collected during the 2024 beekeeping season from 15 apiaries across three regions of Macedonia. All samples were collected in accordance with current honey quality regulations, and all analyzes were performed in an accredited laboratory using validated analytical methods in triplicate. Samples were grouped into meadow honey (M, n = 6) and honeydew honey from mixed regional origin (H, n = 9). Clear compositional differences were observed between the two honey types. Honeydew honey exhibited a significantly darker color (152.15 vs 60.65 mm Pfund, $p < 0.01$) and higher levels of total phenolic compounds (401.06 vs 254.40 mg GAE/100 g, $p < 0.01$) compared to meadow honey. It also showed increased free acidity (34.17 vs 23.33, $p < 0.05$) and higher pH values (3.69 vs 3.05, $p < 0.01$). In contrast, antioxidant activity measured by the DPPH assay did not differ significantly between groups (53.47 vs 53.02%, $p > 0.05$). In conclusion, the two honey types exhibited distinct chemical fingerprints, with honeydew honey of mixed regional origin characterized by higher concentrations of bioactive compounds and greater compositional variability. These findings emphasize the importance of integrated botanical and geographical characterization as a robust tool for accurate honey quality assessment, authentication, and traceability.

Key words: Honey, antioxidant capacity, phenolic profile, variability, North Macedonia.

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CONTEMPORARY BIOTECHNOLOGICAL APPROACHES IN PHYTOTHERAPY

Aleksandar Stevanović⁴³; Snežana Knežević⁴⁴; Marija Perić⁴⁵

Abstract

Phytotherapy, the use of medicinal plants for the prevention and treatment of diseases, represents one of the oldest medical practices. Contemporary biotechnological approaches enable the improvement of the quality, efficacy, and availability of plant-based preparations, while also preserving natural resources and biodiversity. This study analyzes key biotechnological methods, including in vitro plant cultivation, the production of secondary metabolites in cell cultures, and genetic improvement of plants, with a particular focus on nettle (*Urtica dioica*), dandelion (*Taraxacum officinale*), and turmeric (*Curcuma longa*). In vitro cultivation allows rapid multiplication of plants and preservation of rare species; cell cultures enable the production of bioactive compounds such as flavonoids, inulin, and curcumin; while genetic improvement contributes to increased concentrations of medicinal components and plant resistance. The results indicate that biotechnology enhances the quality and concentration of bioactive compounds, for example, in vitro microrhizome cultures of *Curcuma longa* have yielded curcumin concentrations exceeding 260 $\mu\text{g g}^{-1}$ fresh weight under optimized culture conditions, and open new possibilities for developing innovative phytotherapeutic products. These advances necessitate careful consideration of ethical principles and regulatory frameworks governing the use of genetically modified organisms in herbal medicine.

Key words: *Biotechnology, phytotherapy, nettle, dandelion, turmeric*

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INFORMATION OVERLOAD AND CONSUMER FATIGUE IN DIGITAL MARKETING: A PERSPECTIVE ON THE ATTENTION ECONOMY IN THE AGE OF DIGITAL TRANSFORMATION

Marina Guzovski⁴⁶

Abstract

The development of digital technologies and the intensive digital transformation of business have significantly changed the way organizations communicate with consumers. Digital marketing enables the distribution of a large number of information and promotional messages through various digital platforms, exposing consumers to a large amount of content on a daily basis. In such an environment, consumer attention becomes a limited and valuable resource, which is recognized in the scientific literature through the concept of the attention economy. At the same time, a large amount of information and advertising can lead to information overload and the appearance of consumer fatigue. The aim of this paper is to analyze the relationship between information overload and consumer fatigue in the context of digital marketing from the perspective of the attention economy. The paper is based on a review of recent scientific literature in the field of digital marketing, consumer behavior and attention economy. Based on theoretical knowledge, a conceptual model is proposed that explains the connection between digital advertising intensity, information overload and consumer fatigue. The results of the analysis indicate that the increased amount of digital marketing messages can lead to information overload of consumers, which consequently reduces their attention, engagement and willingness to interact with digital ads. The paper contributes to a better understanding of the challenges of managing consumer attention in the digital environment and provides implications for the development of more effective digital marketing strategies in the context of digital transformation.

Key words: *Digital marketing, attention economy, information overload, consumer fatigue, digital transformation.*

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MATHEMATICAL MODEL FOR FRAUD DETECTION IN PROPERTY, PLANT AND EQUIPMENT IN FORENSIC AUDITING

Edin Glogić⁴⁷

Abstract

Property, plant and equipment represent one of the most significant asset categories of business entities and, due to their complexity, long useful lives, and reliance on subjective estimates, carry an increased risk of accounting fraud. Estimates related to asset valuation, depreciation, and useful lives are often based on managerial judgment, which creates opportunities for manipulation in financial reporting. In such circumstances, forensic auditing plays an important role as a specialized discipline focused on the detection of irregularities. This paper aims to develop a theoretical mathematical model for fraud detection based on the analysis of deviations between recorded and expected values and the construction of a composite forensic risk index. The proposed model is based on the assumption that fraud manifests through statistically significant deviations in key accounting parameters, including depreciation, changes in carrying amounts, and the frequency of adjusting entries. By integrating these indicators into a unified mathematical framework, the model enables the quantification of risk at the level of individual asset items. The methodological approach is based on a descriptive and analytical review of relevant literature and the formalization of the model through the definition of variables, parameters, and decision criteria. The results indicate that the application of the proposed model can enhance the effectiveness of forensic auditing by enabling timely identification of anomalies and potentially suspicious items, thereby contributing to more reliable financial reporting and reduced fraud risk.

Key words: *Forensic auditing, property plant and equipment, mathematical model, fraud, detection.*

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GOVERNING THE ALGORITHMIC WORKPLACE: AI-DRIVEN MANAGEMENT AND THE FUTURE OF ORGANIZATIONAL CONTROL

Svetozar Krstić⁴⁸; Vladimir Krstić⁴⁹; Zoran Vučković⁵⁰

Abstract

Algorithmic management has rapidly evolved from rule-based automation to AI-driven decision-making, fundamentally reshaping organizational control, worker autonomy, and workplace governance. While AI-enhanced management systems offer unprecedented efficiency, predictive accuracy, and real-time coordination, they also introduce critical challenges related to transparency, algorithmic bias, surveillance, and the erosion of human discretion. This paper examines the intersection of artificial intelligence and algorithmic management, proposing a governance framework grounded in three core principles: technological transparency, ethical accountability, and human-centered oversight. Drawing on contemporary organizational practices and emerging regulatory standards, the analysis identifies key implementation strategies, including human-in-the-loop protocols, continuous algorithmic auditing, and multi-stakeholder collaboration. The paper further discusses the dual impacts of AI-driven management, highlighting both operational benefits and socio-ethical risks. Conclusions emphasize that sustainable and effective algorithmic governance requires balancing innovation with worker rights, regulatory compliance, and organizational trust. This study contributes to management and information systems literature by offering a structured approach to governing AI-enabled workplaces, with practical implications for corporate policy, HR strategy, and future research.

Key words: *Algorithmic management, artificial intelligence, organizational control, workplace governance, human-AI collaboration, algorithmic accountability.*

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DIGITAL COOPERATIVE A GAME THEORY MODEL OF LARGE SCALE END USER AGGREGATION IN BROADBAND ACCESS MARKETS

Amit Vujic⁵¹

Abstract

This paper develops a digital cooperative game theory model for large-scale aggregation of end users in broadband access markets. We do analyze a coalition consisting of 5,000 digital groups, each composed of 20 households. All households are jointly procuring internet access through one primary fiber Internet Service Provider (ISP) and one fallback 4G/5G Internet Service Provider or satellite provider (Star-link). The coalition operates as a virtual market entrant without owning physical access infrastructure. We formalize the setting as a game for coalition formation with transferable utility, and derive sufficient conditions for the core's non-emptiness. In addition, it computes numerical stability thresholds calibrated to the Serbian Internet Service Provider (ISP) market in order to test the sustainability of the proposed digital cooperative entity (H1). Furthermore, we analyze the economic viability of providing broadband services at approximately half of prevailing retail prices to cooperative members (H2). An additional hypothesis examines user participation incentives in a cooperative characterized by zero entry and exit fees, in contrast to the hidden costs embedded in standard contractual terms offered by incumbent ISPs (H3). Governance and surplus allocation are implemented through a block-chain based cooperative protocol that enforces membership, voting, and profit distribution rules while minimizing coordination costs. The results demonstrate that under realistic wholesale pricing, redundancy, and governance assumptions, the grand coalition remains stable, price dominant, and economically viable across all simulated scenarios.

Key Words: *Digital cooperative, coalition formation, Game Theory, ISP markets, broadband pricing.*

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MASS AND BALANCE OF AIRCRAFT AND THEIR IMPACT ON AIRCRAFT PERFORMANCE

Vojkan Dimitrijević⁵²

Abstract

Aircraft weight and balance are of great importance, primarily for flight safety, as well as for aircraft performance, controllability, and stability. Every aircraft has defined limits for takeoff and landing weight. There is a tendency to load as much payload as possible for economic reasons, but this must be aligned with the aircraft's limitations in terms of allowable weight and its distribution. Variable masses placed within the aircraft structure include cargo, fuel, passengers, and their baggage. The distribution of these masses must ensure proper aircraft balance, meaning that the center of gravity must remain within prescribed limits defined by the aircraft manufacturer. The range between the forward and aft allowable positions is called the aircraft's center of gravity envelope. When the aircraft is fully loaded, the center of gravity must remain within this range. If the center of gravity falls outside the permitted limits, it can lead to loss of control and potentially result in an accident. Shifting the center of gravity within allowable limits can affect aircraft performance, controllability, and stability in different ways. Depending on its position, the aircraft may become more or less responsive to control inputs. Any permissible shift of the center of gravity must be compensated by appropriate aircraft trimming. This paper emphasizes the importance of the center of gravity position and the need to define methods for its accurate determination, which should be precise and easy to apply, allowing for quick calculation of total weight and center of gravity position.

Key words: *Weight, balance, fuel, payload, passengers, aircraft performance, stability and controllability.*

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THE SIGNIFICANCE AND CONDITIONS FOR ACHIEVING THE AUTOROTATION REGIME OF A HELICOPTER MAIN ROTOR

Vojkan Dimitrijević⁵³

Abstract

The significance of this helicopter flight regime is extremely important for safety. This flight mode is used in the event of a failure of the helicopter's powerplant or a malfunction in the transmission system. To achieve this flight regime, certain essential conditions must be ensured, which makes a thorough understanding of the aerodynamic characteristics of the main rotor blades necessary. By understanding these characteristics, it is possible to define the conditions under which the main rotor can be brought into autorotation. Autorotation provides the kinetic energy of the main rotor, which is converted into rotor thrust immediately before ground contact. This enables a soft landing of the helicopter. Due to the specific airflow around the blades, it is necessary to ensure appropriate kinematics, which are achieved through helicopter control inputs. To accomplish this, a certain amount of energy must be available in order to position the blades correctly. As with other aerodynamic surfaces, the aerodynamic characteristics of the blades are influenced by various flight conditions such as barometric pressure, temperature, wind, atmospheric turbulence, and others. All these factors must be taken into account when determining the necessary conditions required to bring the main rotor into autorotation. Modern helicopters are equipped with automated systems within the flight computer, which significantly facilitate the pilot's ability to enter this flight regime.

Key words: *Main rotor, autorotation, rotor blades, required conditions, aerodynamic characteristics.*

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CHALLENGES AND OPPORTUNITIES IN DIGITAL TRANSFORMATION OF HIGHER EDUCATION

*Jelena Bošković⁵⁴; Vera Popović⁵⁵; Aleksandar Filipović⁵⁶; Viliana Vasileva⁵⁷;
Dragana Popović⁵⁸; Jelena Mladenović⁵⁹; Marko Popović⁶⁰; Aleksandar
Stevanović⁶¹*

Abstract

The fast development of digital technologies is changing many facets of society, including higher education. Adapting to the emerging realities of the information economy and the shifting demands of University and students presents both possibilities and problems for higher education institutions. In light of national strategic targets and worldwide trends in digitalisation, the study focuses on a thorough evaluation of the adoption of digital technology, the creation of digital competencies, and the improvement of quality in higher education. The results support the theoretical underpinnings of the Innovation Diffusion Theory and the Technology Acceptance Model in the context of higher education. Particular focus was placed on examining the elements that affect the effectiveness of digital transformation and creating strategies to get past obstacles that were found.

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According to numerous research, empirical analysis showed that the percentage of institutions implementing Learning Management Systems (LMS) increased significantly from 25% in 2013 to 100% in 2023. The degree of adoption of digital technology and measures of educational quality were found to be strongly positively correlated. The absence of a defined digitalisation strategy and institutional resistance to change were found to be the main obstacles to digital transformation. A conceptual model of the relationship between digital transformation and higher education quality has been proposed.

Key words: *Challenges, opportunities, digital transformation, higher education.*



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DIGITAL TRANSITION IN EU HIGHER EDUCATION – EU REGULATION

Nina Maksimović Sekulić⁶²

Abstract

The digital transition in higher education has become a central pillar of the European Union's (EU) policies aimed at fostering innovation, inclusiveness, and sustainability. The COVID-19 pandemic accelerated the need for digital transformation, highlighting the importance of resilient education systems that can adapt to remote, blended, and hybrid learning environments. This paper explores the regulatory and institutional framework established by the EU to support the digitalization of higher education. It examines key policy documents, such as the Digital Education Action Plan (2021–2027), the European Education Area initiative, and funding mechanisms including Erasmus+, Horizon Europe, and the Digital Europe Programme. Special attention is given to challenges such as the digital divide, data protection under the General Data Protection Regulation (GDPR), and quality assurance in e-learning. Case studies from several EU MS illustrate national approaches aligned with EU directives. The paper argues that while substantial progress has been made, significant disparities remain in infrastructure, accessibility, and digital literacy. Recommendations emphasize the need for harmonization across member states, stronger investment in digital skills, and enhanced monitoring mechanisms to ensure compliance with EU standards.

Key words: *Digital education, EU regulation, higher education, digital transformation, European Education Area.*

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THE IMPACT OF NATURAL DISASTERS AND TECHNICAL ACCIDENTS ON THE CONTINUITY OF EDUCATION

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Abstract

Educators globally are confronting a new challenge integrating learning processes with the indirect effects of natural disasters and technological accidents. In a learning continuum, every step impacts the next step. Natural disasters and technical accidents cause school/community infrastructures to fail and prevent the community from accessing educational services. Knowing the impact of these constraints on educational access and continuity is essential to devise means to optimize educational resilience and sustainability. Objective of research was to analyze the impact of natural disasters and technical accidents on educational processes and access and to explore the reasons and other elements of educational disruption. The researchers applied a structured questionnaire and used a descriptive quantitative approach to analyze educational access and processes in disaster-prone areas with a focus on the educational disruption of 320 respondents, including students, teachers, and school administrators. Using descriptive and correlational statistics to analyze disaster-induced educational disruption, the researcher was able to draw conclusions about the relationship and impact of disasters on educational processes and access. The results show that natural disasters and technological accidents disrupt the flow of educational processes; educational disruption is characterized by school closure, physical disruption of educational infrastructure, inaccessibility to educational resources, and unavailability of learning materials. It was observed that educational institutions with emergency preparedness and disaster response frameworks, including alternative education methodologies, experienced less educational disruption. This research establishes that the instability of educational systems is due to the impact

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of natural disasters and technological accidents. It is important to focus on the strengthening of preparedness and resilience strategies so that educational continuity can be sustained during emergencies. This research recommends the advancement of school infrastructure that is disaster resilient, the establishment of programs that prepare for emergencies, the use of learning methods that are based on technology, and the improvement of the collaboration of educational authorities to ensure that education can continue without interruption during emergencies.

Key words: *Natural disasters, technical accidents, educational continuity, disaster preparedness.*



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MODERN EDUCATIONAL MODALITIES: OPPORTUNITIES AND CHALLENGES IN CONTEMPORARY LEARNING

Raka Sharma⁶⁷

Abstract

Education has changed significantly in recent years with the introduction of modern educational modalities and digital technologies. Traditional classroom learning is now complemented by approaches such as online learning, blended learning, flipped classrooms, and technology-supported teaching. These methods have made education more flexible and accessible for students. Learners can now study from different locations and access learning materials at their own pace, which is especially beneficial for those who may face geographical or time-related limitations. Modern educational systems also support personalized learning, allowing students to choose learning paths that match their abilities, interests, and preferred learning styles. Another advantage of these modalities is the use of multimedia tools such as videos, animations, virtual simulations, and interactive platforms. These tools make learning more engaging and help students understand complex concepts more easily. Online discussion forums and virtual classrooms also create opportunities for students to communicate, collaborate, and share ideas with peers and teachers from different parts of the world. Despite these benefits, modern educational modalities also present certain challenges. Not all students have equal access to digital devices or stable internet connections, which can create inequalities in learning opportunities. The reduced face-to-face interaction in online environments may also affect social engagement and immediate feedback between teachers and students. In addition, students studying online often need strong self-discipline and motivation to stay focused. Teachers also require proper training to effectively use digital tools in teaching. Therefore, while modern educational modalities offer many possibilities, their success depends on thoughtful implementation and balanced use alongside traditional teaching methods.

Key words: *Modern education, Online learning, blended learning, educational technology, digital divide.*

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21ST CENTURY SKILLS FOR EDUCATION SUCCESS

Mehreen Mia⁶⁸; Shailja Vasudeva⁶⁹

Abstract

Skills are essential for success in today's fast-paced, interconnected world. In today's rapidly changing world, education must shift from a traditional, disciplinary approach to a holistic, interdisciplinary model. The emphasis on STEM education alone is insufficient, as it neglects the importance of social, emotional, and creative skills. We must advocate for an education system that nurtures capabilities like creativity, imagination, curiosity, and emotional intelligence. The future of jobs demands adaptability, critical thinking, and problem-solving skills. Education should focus on drawing out students' natural passions and talents, rather than molding them into predetermined roles. A growth mindset, rather than perfectionism, is essential for success. Key 21st-century skills include critical thinking, communication, collaboration, creativity, and social responsibility. Educators can integrate these skills into curricula through project-based learning, inquiry-based activities, and opportunities for student choice and reflection. The article highlights the importance of: fostering a growth mindset and adaptability; emphasizing social, emotional, and creative skills; encouraging interdisciplinary learning; preparing students for an evolving job market; supporting teachers in integrating 21st-century skills. By reimagining education, we can empower students to thrive in an increasingly complex and interconnected world.

Key words: *Adaptability, emotional intelligence, self-directed success, time management, mindset resilience, leadership.*

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THE 7CS OF 21ST-CENTURY LEARNING

Mehreen Mia⁷⁰

Abstract

With the quick shifting world we find education must shift from traditional approaches to holistic, interdisciplinary models to best holistically develop our 21st century learners. The 7Cs framework - Critical thinking, Creativity, Collaboration, Communication, information and media literacy, Computing and ICT literacy, Cross-cultural understanding, and Career and learning self-reliance - provides a roadmap for equipping students with essential skills for success. The 7Cs emphasize the importance of adaptability, problem-solving, and social-emotional skills in preparing students for an evolving job market. By integrating these skills into curricula, educators can foster a growth mindset, encourage interdisciplinary learning, and promote lifelong learning. Effective implementation of the 7Cs involves: shifting pedagogical practices towards learner-centered, interactive approaches; encouraging questioning, critical thinking, and creativity; fostering collaboration, communication, and cross-cultural understanding; emphasizing authentic problem-solving and real-world applications; using formative and sustainable assessment strategies. By embracing the 7Cs, educators can empower students to thrive in a complex, interconnected world. This framework offers a vision for education that prioritizes skills, adaptability, and lifelong learning, enabling students to succeed in an uncertain future.

Key words: *Critical thinking, creativity, collaboration, communication, problem solving, lifelong Learning.*

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THE REFORM OF THE HIGHER EDUCATION SYSTEM BETWEEN CONSTITUTIONALITY AND PARTISANSHIP

Atanas Kozarev⁷¹

Abstract

The education system in general, and within that context its subsystem – higher education – from independence to the present day in our country, has undergone several contradictory processes, all sharing a common final perception: not a single reform has secured a respectable position on the relevant Shanghai Ranking List. The politicization of these reform processes has taken precedence over real needs, scientific challenges, and academic interests. In practice, an analysis of the legal texts on higher education shows that each government, during its mandate, adopts a new Law on Higher Education. Amendments and supplements occur continuously and are treated as a normal phenomenon. Such frequent changes in regulation have, in certain periods of higher education development, endangered the autonomy of higher education, thereby opening the door to the appointment of politically affiliated professors. There has also been a noted trend of enriching the academic staff with candidates who are in direct first-line kinship relations, along with other negative tendencies. Furthermore, it can be observed that there is a discriminatory approach toward the state (public) and private higher education sectors, with the proclamation and subsidization of scientific research activities reserved exclusively for state universities in the Republic of North Macedonia. All these reform processes contribute to the degradation and decadence of higher education, with maximum partisan support from those in power.

Key words: *Higher education, reform, challenges, public interest.*

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META-COMMUNICOLOGY AS A REFLEXIVE FRAMEWORK FOR CONTEMPORARY COMMUNICATION STUDIES

Dragana Jovanovic⁷²

Abstract

This paper introduces meta-communicology as a reflexive, meta-theoretical framework within Communication Studies. Drawing on epistemology and the concept of reflexivity, the study examines how knowledge about communication is constructed, legitimized, and transformed. Contemporary communication environments are increasingly shaped by algorithmic systems, platformization, and artificial intelligence. Traditional paradigms within Communication Studies are insufficient to explain these transformations. This paper argues for the introduction of meta-communicology as a higher-order analytical framework. Unlike first-order communication analysis and second-order theoretical modeling, meta-communicology operates at a third level—critically examining the epistemological and ontological assumptions underlying communication theories. The paper develops a three-level analytical model and situates meta-communicology within the context of digital and algorithmic communication. The main contribution lies in conceptualizing a third-order analytical framework that critically evaluates communication theories themselves.

Key words: *Meta-communicology, reflexivity, discourse, communication theory, digital media.*

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AI ASPECTS INFLUENCING UNIVERSITY WRITING COURSES

Sabina Zejnelagic⁷³

Abstract

Since AI has become an integral part of both learning and teaching, the paper is focused onto the AI aspects that have influenced onto university writing courses. The research is centered towards the writing courses offered at a university level, and what are the aspects to be reconsidered in this changed context of writing. It is an empirical experience that has evoked a few aspects of AI that have to be examined and researched more regarding this issue. The main aim of the paper has been to draw attention to some of newly created issues regarding university writing courses, and to offer remarks that could be beneficial in the future researches.

Key words: *AI, writing courses, university, teaching and learning processes.*

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LANGUAGE IN PRACTICE: A MULTIDISCIPLINARY APPROACH

Arun Guleria⁷⁴; Pooja Vasudeva⁷⁵

Abstract

Language is a dynamic medium through which societies construct knowledge, negotiate identities, and transmit cultural traditions and all this happened because of a structural system of communication. The present study, *Language in Practice: a Multidisciplinary Approach*, examines the functional and contextual dimensions of language by drawing upon perspectives from linguistics, cultural studies, anthropology, and political discourse. Rather than viewing language solely as a grammatical or literary construct, the paper foregrounds its practical role within lived social realities and intellectual traditions.

The study explores how linguistic practices operate across diverse disciplinary contexts, shaping modes of expression, knowledge production, and cultural continuity. Particular attention is given to the interaction between language and social structures, demonstrating how linguistic forms both reflect and influence cultural identities, ideological frameworks, and scholarly communication. By situating language within a broader interdisciplinary framework, the paper highlights its capacity to bridge textual scholarship with everyday communicative practices. Ultimately, the paper argues that a multidisciplinary engagement with language offers a more comprehensive understanding of its practical significance in sustaining cultural heritage, facilitating intellectual exchange, and responding to the evolving demands of contemporary society.

Key words: *Language practice, multidisciplinary studies, cultural discourse, linguistic identity, interdisciplinary approaches.*

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ECOLOGICAL PERSPECTIVE ON MULTILINGUALISM AND LANGUAGE SUSTAINABILITY

Slobodanka Đolić⁷⁶

Abstract

In the twenty-first century, English has become a central component of the global linguistic landscape, functioning both as a lingua franca and as a powerful force shaping sociocultural, political, and intellectual exchange. Its rapid expansion across diverse linguistic contexts has produced interactions between global and local languages, raising questions of linguistic diversity, equity, and identity. This paper examines the relationship between Global English, linguistic ecology, and multilingualism within an ecolinguistic and sociolinguistic framework. Drawing on key concepts from linguistic ecology, languages are understood as interconnected systems embedded in broader social and cultural environments, in which English operates as both a facilitating and a potentially disruptive force. On one hand, the widespread use of English promotes international communication and enables the exchange of knowledge across academic, economic, and cultural domains. On the other hand, its dominance may contribute to linguistic homogenization and accelerate the decline of minority and local languages. As languages interact within dynamic sociocultural settings, the global spread of English inevitably reshapes relationships among coexisting languages. The study further examines how English interacts with regional and minority languages, transforming linguistic hierarchies, communication practices, and symbolic capital in globalized societies. Particular attention is given to identity formation, linguistic biodiversity, and the sustainability of smaller language communities. In many contexts, English simultaneously serves as a tool for global participation and a force that may marginalize local linguistic practices. The analysis suggests that maintaining balance in the global linguistic ecosystem requires greater multilingual awareness and inclusive language policies that support linguistic diversity while recognizing the practical role of English in global communication.

Key words: *Global English, linguistic Ecology, multilingualism, language sustainability, language inequality.*

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VOCABULARY AND STRUCTURAL ISSUES IN LITERARY TRANSLATIONS

Dragana Spasić⁷⁷; Milica Spasić Stojković⁷⁸

Abstract

The process of translating from source language to target language and vice versa is a rather complex matter. Choosing the right method of translation is always difficult, as it is difficult to make a proper connection between the writer of the original text and the reader of the translated text. That is why the basic goal of this research is to provide certain answers to the problem of translating. The authors reviewed the book *What is Freedom*, a collection of literary works of primary school Serbian children in the central part of Kosovo. The translations of some of these literary works from Serbian into English and their analysis will be presented in this paper. The first part of the research will be based on theoretical opinions about translations of literary texts, which is why the written sources of certain contemporary authors will be reviewed and presented in the paper. The second part of the paper will include the comparison of the original translation, and another one done by the second translator in order to point out to similarities and differences in choosing vocabulary and solving certain structural issues to provide the best possible translation. That is why several appropriate methods will be combined. The research is based on ten out of fifty poems and five out of twenty literary texts from the collection. Recommendations for further research will also be provided.

Key words: *Translation, literary works, poems, vocabulary, structural issues.*

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FROM ASSISTANCE TO DEPENDENCE: AI IN EFL LEARNING – TRANSFORMATION OR REPLACEMENT?

Nataša Lukić⁷⁹

Abstract

The integration of artificial intelligence (AI) into education is rapidly redefining teaching and learning practices, particularly in English as a Foreign Language (EFL) context. AI-based technologies, including conversational chatbots, automated writing evaluation tools, speech recognition systems, and adaptive learning applications, are increasingly used to support language learning. These tools enable individualized instruction, immediate feedback, and flexible learning environments, thereby enhancing students' opportunities to practice and improve their language skills. At the same time, the growing reliance on AI raises significant concerns regarding its long-term pedagogical impact. While AI can facilitate learning processes, excessive dependence on such technologies may compromise learner autonomy, reduce cognitive engagement, and limit the development of authentic communicative competence. Furthermore, issues such as academic dishonesty, over-reliance on automated feedback, and unequal access to digital tools challenge the effective and ethical integration of AI in EFL education. This paper critically examines whether artificial intelligence is primarily transforming EFL learning or gradually replacing key elements of human-mediated instruction. It investigates both the benefits and risks of AI integration and explores how the role of the teacher is being redefined in technology-rich classrooms. The study argues that AI should be positioned as a supportive educational resource rather than a substitute for human instruction, emphasizing the need for balanced, reflective, and pedagogically sound implementation.

Key words: *Artificial intelligence, EFL learning, digital education, learner autonomy, language teaching*

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DRY POINT

Gordana Petrović⁸⁰

Abstract

The *dry point* printmaking technique consists of manual incision of lines of varying width and quality by engraving, i.e. scratching, scraping, as well as the creation of different tones and structures by their intersection on a plate (matrix), in accordance with the needs of artistic expression. The plate for such treatment can be made from multiple types of metal, plastics or other materials that allow for direct manual engraving and, later, impression. The tools used for the achievement of engraving effects is needle-tipped metal with different profiles, hence the point in the name of the technique. Given the absence of fluids in the engraving process the technique is called **dry**. This is why the technique is called *dry point*. In the early days of printmaking art development, dry point was mostly used for finishing and the addition of selected darker tones to those created by other methods. By applying paint to the entire matrix one can achieve easy swiping of flat, smooth, unengraved sections of its surface, while paint is preserved in the deep, engraved lines („scratches“). By placing paper on the surface of the matrix and pulling it through the press with pressure for deep printing, the paper is squeezed into the engraved depressions and absorbs the paint. Lifting the paper from the matrix after the imprinting produces the print of what the artist has „drawn“ in metal. Because of the absence of acids and organic solvents, this printmaking technique can be considered ecological and harmless for the lungs and airways of the artist.

Key words: *Printmaking, dry point, engraving, print.*

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RELIGIOUS COMMUNITIES IN THE CONTEMPORARY COMMUNICATION SPACE: SOCIAL FUNCTION AND INTERNAL COMMUNICATION CHALLENGES

Mirko Smoljić⁸¹; Jure Papić⁸²

Abstract

Religious communities continue to represent important social actors in the shaping of values, identity, and social cohesion, but their activity today takes place in a profoundly transformed communication environment marked by digitalization, media networking, and accelerated information flows. The aim of this paper is to analyse the social function of religious communities in the contemporary communication space and to examine the main challenges of their internal and external communication. The central research question is as follows: how do contemporary communication patterns influence the social role of religious communities and their communication with the public, the media, and their own organizational structures? The paper is conceived as a review article and is based on the analysis of relevant literature in the fields of communication studies, sociology of religion, and institutional communication, with a comparative overview of communication practices across different religious communities. It proceeds from the assumption that religious communities, despite major changes in the communication environment, continue to play an important social role, but that their communication effectiveness increasingly depends on their ability to adapt to new media patterns, maintain transparency, and reconcile traditional value-based messages with the expectations of contemporary society.

Key words: *Religious communities, contemporary communication space, internal communication, social function, institutional communication.*

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BETWEEN TRADITION AND MODERNITY: RELIGION AS A CULTURAL PATTERN IN CONTEMPORARY EDUCATION – AN ORTHODOX PERSPECTIVE

Slobodan Milić⁸³

Abstract

Contemporary education stands at the crossroads between modernity and culturally-traditional patterns shaped throughout history. In this paper, the author seeks to examine the reach of Orthodoxy in contemporary education through the lens of cultural pattern, with particular reference to the Serbian context. Starting from the thesis that Orthodoxy has historically shaped Serbian society and played a significant role in education, the paper analyzes the tensions and challenges faced by Orthodox traditional teaching in relation to the processes of secularization, the neoliberal model of education, and technological civilization, which suppresses human creativity and raises the question of the 'meaning of creativity' (Berdyayev). The paper is based on a theoretical and conceptual analysis of contemporary literature in the fields of sociology of religion, Orthodox theology, and philosophy of education. The author holds that such an approach can contribute to a deeper understanding of the role of Orthodoxy as a cultural pattern in the contemporary Serbian educational system, and that it is of great importance to open further sociological discussion on the topic of tradition and modernity in the turbulent times that lie ahead.

Key words: *Orthodoxy, education, cultural pattern, tradition, modernity.*

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AI AND BEYOND AS ANTICIPATED IN LITERATURE AND POPULAR CULTURE

Vesna Anđelić Nikolendžić⁸⁴

Abstract

In the beginning was the Word, then were many words, and at some later point in time there were the Words - *Artificial Intelligence*, the syntagma was coined only to be further reduced, abbreviated to just two universally accepted and recognizable letters - AI. The idea of computers designed to process data at a pace that a human being could never hope to achieve appeared in literature long before first IT experts started writing codes and designed anything distantly resembling such machines. It was frequently revisited due to its obvious appeal and developed in the works of some of the most renowned authors as well as in popular culture, more readily consumed by the general public, and the entertainment industry, primarily in films, broadly divided into utopian and dystopian genres. Author traces back the origin of the concept and follows its evolution over various epochs and across different social and geopolitical backgrounds, finally focusing on the anticipated 'history' of AI. Where will it take us? Can we change our mind about it? Will we regret delegating too much power? What is the point of no return? What will living in the post-AI world be like?

Key words: *AI, literature, popular culture, utopia, dystopia.*

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TAILORING POLYMER NANOCOMPOSITES FOR EFFICIENT IONIZING RADIATION SHIELDING

*Danica Jovašević⁸⁵; Kristina Pavićević⁸⁶; Ivana Jelić⁸⁷;
Maja Rajković⁸⁸; Marija Šljivić-Ivanović⁸⁹*

Abstract

Polymer nanocomposites (PNCs) are increasingly investigated as alternatives to conventional shielding materials used in protection against ionizing radiation. While lead and concrete remain widely applied due to their high attenuation efficiency, their limitations, including toxicity, high weight, and limited flexibility, have driven the search for alternative materials with improved functional and application-specific performance. PNCs offer a unique combination of low density, mechanical flexibility, and the ability to incorporate high atomic number (high-Z) fillers. The reduction of filler size to the nanoscale significantly increases the surface area and improves radiation attenuation efficiency, particularly for gamma and X-ray radiation, while also enabling effective design strategies for neutron shielding through the incorporation of hydrogen-rich components. Recent studies have focused on the development of PNCs reinforced with various high-Z nanofillers, including lead-, bismuth-, and tungsten-based compounds, as well as multi-component systems for enhanced radiation attenuation. Experimental investigations have examined the effects of nanoparticle type, size, concentration, and dispersion within different polymer matrices on shielding performance against gamma rays, X-rays, and neutrons. These findings highlight the potential of PNCs as lightweight, non-toxic, and highly tunable materials for next-generation radiation shielding applications in medicine, nuclear technology, and aerospace.

Key words: *Polymers, nanocomposites, radiation protection, radiation attenuation.*

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ETHICAL, LEGAL, AND SECURITY ASPECTS OF ARTIFICIAL INTELLIGENCE IN ENVIRONMENTAL SYSTEMS

Nermin Lapandić⁹⁰, Hadžib Salkić⁹¹

Abstract

The increasing use of artificial intelligence in environmental systems raises significant ethical, legal, and security challenges. This paper analyzes issues related to transparency, accountability, data protection, and the reliability of AI-based environmental decision-making systems. Particular attention is given to the legal validity of AI-generated outputs and the risks of algorithmic bias and data misuse. The study emphasizes the need for clear regulatory frameworks and ethical guidelines to ensure responsible and secure application of artificial intelligence in environmental protection.

Key words: *Artificial intelligence, ethics, law, security, environmental governance.*

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MANAGEMENT AND SILVICULTURE OF SPECIAL-PURPOSE FORESTS

Milun Krstić⁹²; Marina Vukin⁹³; Violeta Babić⁹⁴; Branko Kanjevac⁹⁵; Slobodan Stefanović⁹⁶

Abstract

It is widely recognized that forests represent the most complex natural ecosystem and exert the greatest influence on the regulation of the normal functioning of the biosphere. Forest functions can be classified into main categories: production functions, protective-regulatory functions and socio-cultural functions. In accordance with the principles of applied ecology, these functions are also considered forest ecosystem services. Such a segregation of the ecological, economic, and social potentials, roles, and importance of forests has historically generated a dilemma within the broader public regarding their use and maintenance. This dilemma is often expressed through the question of whether priority should be given to the management of commercial forests or to the preservation of untouched forests that develop spontaneously and exhibit characteristics of "old-growth forests". Even today, the production functions of forests are often not presented objectively, and forestry as a discipline is frequently perceived solely as an economic sector that exploits this exhaustible natural resource. However, integrated and multifunctional forestry, based on the principle of sustainability of all forest outputs and benefits—i.e., sustainable development—demonstrates that any forest which successfully fulfills its production function simultaneously provides, to the greatest possible extent, all other functions as well.

Key Words: *Nature protection, special-purpose forests.*

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THE NUCLEAR ENERGY IMPACT ON ENVIRONMENTAL MANAGEMENT DEVELOPMENT

Radošević Igor⁹⁷

Abstract

Nuclear power instills fear in citizens because of the environmental disasters of the past (Chernobyl, Fukushima). Solving energy problems can be analyzed from the point of view of thermal power plants, hydroelectric power plants and nuclear power plants in order to provide energy for the development of industry and facilitate the daily life of citizens. The environmental management has influenced the formation of the foundations for modern standards of control, risk assessment, policy and long-term planning (integrated management systems, impact on the mining of uranium ore and permanent waste, monitoring, ISO standards, crisis management) from the fear of nuclear consequences. Environmental policies are in conflict over nuclear power, which some countries interpret as clean, while even calling it green energy. Thermal power plants have been proven to pollute the environment more, because CO₂ emissions are almost non-existent during their operation (10g CO₂ per kWh). The example of France, which has built over 50 reactors, has shown us that they have the lowest CO₂ emissions in Europe. Some countries have combined nuclear and hydroelectric power plants. The only problem with nuclear power plants is the storage of radioactive waste, for which solutions developed technologies already exist. The aim of the research is to present the advantages and disadvantages of nuclear energy in the development of environmental management, where the research results will be presented using a comparative method and content analysis.

Key words: *Nuclear power plants, environment, management, pollution.*

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APPLICATION OF AN INTEGRATED MODEL FOR GEOTHERMAL WATER MANAGEMENT IN THE CIRCULAR ECONOMY: A SUSTAINABLE APPROACH TO RESOURCE MULTIPLICATION

Tatjana Knežević⁹⁸

Abstract

Geothermal energy represents a key element in the transition toward an economy based on the principles of sustainability. The model includes an analysis of the use of geothermal water across multiple sectors: building heating, industrial processes, electricity generation, and even transportation. The focus is on a closed-loop system-minimizing waste and maximizing efficiency. The model examines how heat is transferred, recycled, and reused, supported by the introduction of smart grids and digital solutions. The key objectives are the reduction of CO₂ emissions, the preservation of natural resources, and the achievement of energy independence. The application of geothermal energy significantly reduces CO₂ emissions, thereby directly contributing to the fight against climate change. The protection of groundwater resources and ecosystems represents an additional benefit. Furthermore, reduced dependence on fossil fuels leads to lower air pollution. In the long term, this approach also results in substantial energy savings. This model paves the way for the creation of an economically viable and environmentally neutral system.

Key words: *Geothermal water, circular economy, sustainable energy, resource management, CO₂ emission reduction, closed-loop system.*

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SUSTAINABLE PUBLISHING: CONTEMPORARY ENVIRONMENTAL MANAGEMENT TRENDS IN EDITORIAL AND PRODUCTION PROCESSES

Rasynal Tenrisanna⁹⁹; Sitti Rugayya¹⁰⁰; Siti Raviah¹⁰¹; Benget Simamora¹⁰²

Abstract

The publishing industry has a notable impact on the environment due to its reliance on paper, energy, and distribution systems. In response to growing environmental concerns, sustainable publishing has become an important approach to reducing this impact. This study is guided by sustainability theory, the triple bottom line framework, and circular economy theory, which emphasize balancing environmental responsibility, economic performance, and social value. This article explores contemporary trends in environmental management within editorial and production processes, focusing on digital transformation, sustainable materials, green printing technologies, and workflow efficiency. A qualitative descriptive methodology is used, drawing on recent literature and industry practices to examine how these strategies are applied. The results show that many publishers are shifting toward digital platforms, reducing paper use, adopting print-on-demand systems, and using eco-friendly materials. These practices help lower environmental impact while improving efficiency in production processes. In conclusion, sustainable publishing demonstrates that integrating environmental management theories into practice can support both ecological sustainability and business performance. Innovation and commitment to sustainability are essential for the future development of the publishing industry.

Key words: *Sustainable publishing, environmental management, digital transformation, green printing, production efficiency, eco-friendly materials.*

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INTEGRATING CLIMATE CONSIDERATIONS INTO STRATEGIC ENVIRONMENTAL ASSESSMENT: CHALLENGES AND OPPORTUNITIES IN SERBIA

Marina Nenковиć-Riznić¹⁰³

Abstract

Recent practice of Strategic Environmental Assessment (SEA) in Serbia indicates that climate change is still predominantly treated descriptively, within the analytical phase of planning and without any clear role in the evaluation of planning solutions. This disables the ability of SEA to support decision-making process in the occasion of climate changes and extreme events. The aim of this paper is to examine possibilities for improving SEA practice in Serbia through a more structured integration of climate-related criteria into the assessment of spatial and urban plans. The research is based on a qualitative analysis of selected SEA reports and planning documents, in order to define present state in the climate change consideration. It also proposes a basic risk-based approach which evaluates possible consequences of climate exposure on planning solutions. The results will show that the incorporation of climate related criteria at earlier stages of the planning process could enable better decision-making process in the planning and help to differentiate planning options according to their sensitivity to climate stress, particularly in relation to urban form, public functions and infrastructure. This approach contributes to shifting SEA from a descriptive and qualitative assessment to a more quantitative, decision-supporting instrument. The paper highlights the need for further development of instruments and tools withing SEA that would strengthen the role of climate considerations in planning practice, while remaining compatible with existing institutional and regulatory frameworks.

Key words: *Strategic Environmental Assessment, climate change, spatial planning, climate risk, urban development, Serbia.*

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GREEN INFRASTRUCTURE IN URBAN AREAS: A CONTEMPORARY APPROACH TO URBAN CLIMATE RESILIENCE

Mirjana Bartula¹⁰⁴; Ivana Šekler¹⁰⁵; Dragan Jeremić¹⁰⁶

Abstract

Urban areas are increasingly facing environmental challenges such as air pollution, urban heat island effects, and biodiversity loss. In this context, Green Infrastructure emerges as a key contemporary approach to sustainable urban planning and environmental management. This paper explores the role of green infrastructure elements, such as urban parks, green roofs, green corridors, in improving environmental quality and enhancing urban resilience. The paper aims to analyze how the integration of green infrastructure contributes to climate change mitigation and adaptation, particularly through temperature regulation, stormwater management, and carbon sequestration. Special attention is given to the multifunctionality of green spaces and their social and economic co-benefits, including improved public health and quality of life. The paper also examines selected case studies from European cities, highlighting best practices and implementation challenges. The results indicate that strategic planning and cross-sectoral collaboration are essential for maximizing the benefits of green infrastructure.

Key words: *Green infrastructure, climate change mitigation, strategic planning.*

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IMPROVING ECONOMIC MAIZE PRODUCTIVITY AND YIELD STABILITY THROUGH PEA-OAT INTERCROPPING IN RAINFED CONDITIONS

*Viliana Vasileva¹⁰⁷; Emil Vasilev¹⁰⁸; Vera M. Popović¹⁰⁹; Marko B. Popović¹¹⁰;
Jelena Bošković¹¹¹; Vera Rajičić¹¹²; Jela Ikanović¹¹³*

Abstract

Applying appropriate agronomic practices is crucial for successful maize cultivation as a key food crop under changing climatic conditions. In a field experiment under rainfed conditions, we evaluated the effects of monoculture maize (Kneja 561 hybrid) versus maize grown after intercropping. For the intercropping a pea-oat mixture (3:1) was used, where pea supplied biologically fixed nitrogen and oat enhanced biomass formation and soil structure. The pea:oat mixture is a cover crop that was used in order to improve soil fertility and nutrient availability prior to maize sowing. The role of peas is to fix nitrogen, and oats, to increase organic matter, suppress weeds and prevent erosion, which together improves the structure of the soil and the availability of nutrients. The mixture was incorporated into the soil in the autumn of the preceding year. Grain yield was measured at standard moisture content, and a yield stability index (SYI) was calculated. Intercropping had a positive effect on grain yield. Relative to monoculture, grain yield following intercropping was significantly higher by 16.5% at $p < 0.05$. The stability yield index was also higher after intercropping (SYI 0.904) than under monoculture maize (SYI 0.882).

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These results highlight the role of intercropping in improving grain yield and yield stability in rainfed maize systems.

Key words: *Maize, intercropping, pea-oat mixture, rainfed agriculture, grain yield, Sustainable Yield Index.*



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CROSS-CORRELATION ANALYSES OF KARST SPRING DISCHARGE IN THE FUNCTION OF CLIMATE CHANGE

*Aleksandar Tanasković¹¹⁴; Vesna Ristić Vakanjac¹¹⁵; Veljko Marinović¹¹⁶;
Dušan Polomčić¹¹⁷; Jovana Lončar¹¹⁸*

Abstract

In hydrogeological practice, cross-correlation analyses are often used to define the influence of the pluviographic regime on the regime of quantitative and qualitative parameters of karst springs. In general, the cross-correlation function represents an analysis of time series in a bivariate environment and in the time domain, whereby the mutual dependence of two discretized variables is defined, one being dependent and the other independent. When it comes to karst hydrogeological systems, the cross-correlation function implies the analysis of the correlation between the input and output parameters of the system, i.e., precipitation (P) or effective infiltration (the input signal into the system) and groundwater discharge at the spring (Q) (the output signal from the system). Essentially, the influence of precipitation on discharge is considered, as well as the time required for the system to react in terms of recharge, expressed as an increase in spring discharge because of newly infiltrated water. This analysis also provides a more detailed insight into the functioning and behavior of the karst hydrogeological system under different hydrological conditions. Furthermore, it gives information about the character of discharge and the influence of precipitation on the formation of karst groundwater outflow.

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In the specific case, cross-correlation analysis will be presented on the example of several karst springs, both for the entire observation period and for extremely dry and wet years, which are increasingly frequent events in accordance with climate change occurring globally across the planet.

Key words: *Kaquifer, discharge, precipitation, cross-correlation analysis, climate changes.*



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THE TRANSFORMATION OF NITROGEN OXIDES AND BLACK CARBON DURING INCREASED HUMIDITY IN URBAN AREA

Mirjana Cvijović¹¹⁹

Abstract

The study investigates the dynamics of air pollutant chemical transformation within urban environments under specific meteorological constraints. The research focuses on the combined effects of temperature inversion and increase humidity, conditions that severely inhibit vertical mixing and promote the accumulation of nitrogen oxides (NO_x) and black carbon (BC) in ground layer. Beyond the primary toxicity, the work highlights the role of NO_x as critical precursor in the photochemical formation of tropospheric ozone (O₃) under UV radiation, further deteriorating urban air quality. To evaluate the physiological impact of these pollutants, the study utilizes C-reactive protein (CRP) levels as clinical biomarker for systemic inflammation in the exposed population. Statistical analysis reveals a significant correlation between periods of atmospheric instability and increase CRP concentrations in patients reporting to health centers. These findings underscore the acute health risks posed by the synergistic interaction between urban topography, stagnant weather patterns, and complex chemical transformations. The NO_x, determined spectrophotometrically, while CRP determined by mass spectrometer.

Key words: *NO_x oxides, black carbon, Ozone, spectrophotometry.*

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URBAN TRANSPORT INFRASTRUCTURE AS A STRUCTURAL COMPONENT OF RESILIENT CITIES: LESSONS FROM CRISIS SITUATIONS

Igor Jokanović¹²⁰; Milena Grbić¹²¹; Milica Pavić¹²²; Olivera Dulić¹²³

Abstract

Urban transport infrastructure has traditionally been understood as a system enabling mobility; however, in contemporary urban theory it also represents a fundamental spatial framework shaping the structure, functionality, and resilience of cities. This paper examines how the spatial configuration of street networks, public spaces, and multimodal corridors influences the capacity of urban systems to respond to and recover from crises, including natural disasters, technological incidents, and public health emergencies. The research is based on a comparative analysis of selected case studies, with particular focus on the 2014 floods in Serbia and the city of Obrenovac as a representative example of urban vulnerability. The analysis considers spatial, functional, and organizational aspects of transport infrastructure under disruption. The results indicate that resilience largely depends on the structure of the local street network. While arterial routes enabled aid delivery, local networks became critical bottlenecks, with over 80% of streets impassable and limited evacuation routes causing congestion and isolation. Conversely, adaptive measures such as temporary bridges and rail transport improved evacuation and aid distribution efficiency. The paper concludes that resilience is not only a technical property of infrastructure, but also a direct outcome of spatial and urban planning decisions.

Key words: *Urban transport infrastructure, urban resilience, spatial planning, public space, crisis management.*

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GEOLOGICAL SUBSTRATE IN THE FUNCTION OF RUNOFF FORMATION, EXAMPLE OF THE TOPLDOLSKA AND DOJKINAČKA RIVER BASINS (SOUTHEASTERN SERBIA)

*Vesna Ristić Vakanjac¹²⁴, Aleksandar Tanasković¹²⁵, Veljko Marinović¹²⁶,
Boris Vakanjac¹²⁷, Dušan Polomčić¹²⁸, Hristina Petrova¹²⁹, Jelena Ratković¹³⁰*

Abstract

The formation of runoff from a basin is influenced by its physical-geographical characteristics such as geographical position, orography, climatic features, geological and hydrogeological characteristics, forest cover, the presence of karst and lakes within the basin, pedological characteristics, and similar factors. To highlight the importance of geological and hydrogeological characteristics in runoff formation, two neighboring catchment areas were selected: the basin of the Toplodolska River and the basin of the Dojkinačka River. The selected basins have similar orographic characteristics (they drain the southern slopes of Stara Planina), similar pluviographic characteristics (they are in the same area), similar forest cover, and no lakes present in either basin. In addition, the hydrological basin sizes are similar, with the only significant difference being in geological characteristics. The Toplodolska River basin is predominantly composed of red Permian and Lower Triassic sandstones, conglomerates, siltstones, and claystones, meaning that

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fissure aquifers dominate the basin. The Dojkinačka River basin is built in its upper part of Lower Triassic sandstones and conglomerates, while the middle and lower parts are composed of Middle Triassic limestones, dolomitic limestones, and dolomites, so that, in addition to fissure aquifers, karst aquifers also play a significant role in runoff formation. The paper presents the formation of runoff in both streams through the analysis of direct runoff as well as the analysis of the baseflow index. Furthermore, an analysis of the impact of expected climate change on the runoff of these two streams is also provided.

Key words: *Hydrological basin, geological substrate, runoff, baseflow index, Toplodoplska River, Dojkinačka River.*



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METEOROLOGY-INFORMED CIRCULAR STRATEGIES FOR WASTE MANAGEMENT SYSTEMS

Vesna Alivojvodić¹³¹; Marina Stamenović¹³²

Abstract

Heatwaves, intense precipitation, floods, and prolonged droughts increasingly act as systemic stressors for waste management systems, directly shaping how these systems operate and, in turn, the prospects for a circular economy (CE) transition. Such events disrupt collection schedules and logistics, but their effects go further. They alter both the quantity and the morphological composition of waste streams and can compromise the functioning of treatment infrastructure, either temporarily or over the long term. Current CE policy instruments and indicator frameworks remain strongly focused on material flow efficiency and greenhouse gas emission reductions. The role of meteorological and broader climate-related factors in system performance, however, is still only marginally addressed. In this context the paper develops a coupled assessment framework that incorporates meteorological data and regional climate projections into the planning and performance assessment of circular waste management strategies. The analysis examines seasonal and multi-year variability in waste generation and composition to evaluate the sensitivity of infrastructure, including treatment facilities, transfer stations, and logistics networks, to extreme weather events. The study outlines historical meteorological records, operational waste flow data, and scenario-based modeling to evaluate how targeted circular interventions affect system performance and vulnerability. The results indicate that weather-related operational disruptions occur less frequently and with lower severity in systems where meteorological monitoring and adaptive infrastructure design are embedded within circular waste management planning.

Key words: *Circular economy, waste management systems, extreme weather events, climate adaptation, infrastructure resilience, scenario analysis.*

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APPLICATION OF ARTIFICIAL INTELLIGENCE IN CLIMATE RISK PREDICTION AND MANAGEMENT

Hadžib Salkić¹³³

Abstract

Climate change represents one of the most serious global challenges, significantly affecting environmental stability, economic systems, and human security. Traditional climate risk assessment models often fail to address the complexity and dynamic nature of extreme weather events. This paper analyzes the application of artificial intelligence, particularly machine learning and deep learning methods, in predicting and managing climate risks such as floods, droughts, heatwaves, and extreme precipitation. By utilizing large climate datasets, meteorological records, and satellite imagery, AI models enable more accurate forecasting and early warning systems. The results demonstrate that artificial intelligence significantly improves decision-making processes and supports sustainable climate adaptation strategies.

Key words: *Artificial intelligence, environmental protection.*

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AI-ASSISTED SYSTEMS FOR BIODIVERSITY MONITORING AND CONSERVATION

Hadžib Salkić¹³⁴

Abstract

The rapid loss of biodiversity poses a serious threat to ecosystem stability and long-term sustainability. Conventional biodiversity monitoring methods are often limited by cost, time, and spatial coverage. This paper explores the application of artificial intelligence-based systems for biodiversity monitoring and conservation. Computer vision algorithms, neural networks, and pattern recognition techniques are applied to data collected from drones, cameras, and sensor networks. AI-assisted systems enable accurate species identification, monitoring of population changes, and early detection of habitat degradation, thereby improving conservation strategies.

Key words: *Biodiversity, artificial intelligence, computer vision, ecosystem monitoring, conservation.*

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ASSESING AGED ASPHALT FOR RADIONUCLIDE IMMOBILIZATION AND SUSTAINABLE WASTE MANAGEMENT

*Danica Jovašević¹³⁵; Kristina Pavićević¹³⁶; Ivana Jelić¹³⁷; Maja Rajković¹³⁸;
Marija Šljivić-Ivanović¹³⁹*

Abstract

The high costs of immobilization, storage, and disposal of liquid radioactive waste (LRW) have driven investigations into low-cost sorbents derived from production or end-of-life materials. Construction and demolition waste (C&DW), which represents the largest global waste stream, accounts for nearly 75% of total waste and 31–40% of solid waste, with relatively low recycling rates outside the construction sector. Recent studies have considered C&DW as a potential material for the immobilization of radionuclides. In particular, waste asphalt, chemically compatible with bitumen used in LRW matrices, has been investigated for the immobilization of low-level liquid radioactive waste, demonstrating the ability to retain radionuclides and heavy metals such as Co, Ni, Pb, Zn, and Cu through sorption and physical encapsulation mechanisms. These findings suggest that waste asphalt could also be effectively applied for the immobilization of radionuclides, including strontium. XRD analyses indicated that waste asphalt mainly contains mineral phases such as quartz, calcite, and dolomite, originating from aggregates and fillers used in asphalt mixtures. FT-IR spectra confirmed the presence of Si–O and carbonate groups, while bands associated with alkyl groups of the bituminous binder are often weak or absent due to aging processes (oxidation and volatilization) under atmospheric conditions. Aged asphalt exhibits limited immobilization capacity for metal ions, with sorption decreasing in the order $Pb \approx Zn > Cu > Co \approx Ni > Sr$. While fresh bitumen can physically encapsulate radionuclides and heavy metal ions in a stable matrix,

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reducing their mobility, waste asphalt lacks sufficient reactive organic groups and active sites, limiting its efficiency for binding and encapsulation. Despite these limitations, the wide availability of waste asphalt makes it a potential component for LRW treatment, contributing to C&DW valorization and more sustainable management.

Key words: *Radioactive waste, solidification, sorption, construction and demolition waste.*



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URBAN FOOD WASTE MANAGEMENT: LEGAL BARRIERS AND SUSTAINABLE SOLUTIONS

Suzana Knežević¹⁴⁰; Milena Milojević¹⁴¹; Aleksandra Milošević¹⁴²

Abstract

Food waste constitutes one of the largest fractions of municipal waste in urban areas and represents an increasing environmental and management challenge. This paper aims to examine legal restrictions affecting food waste management in urban systems and to evaluate sustainable alternative treatment options in line with circular economy principles. The study is based on a qualitative review of relevant scientific literature, regulatory frameworks, and strategic policy documents, complemented by a comparative analysis of different food waste valorization pathways. The results indicate that the use of food waste as animal feed in urban areas is significantly limited by regulatory constraints, health and safety concerns, and inadequate infrastructure. Conversely, alternative management options, such as composting and anaerobic digestion, demonstrate greater feasibility and environmental benefits in urban contexts. The analysis further emphasizes that effective food waste management in urban areas requires an integrated approach involving local authorities, appropriate policy instruments, and the development of efficient collection and treatment systems. The findings suggest that the implementation of sustainable food waste management solutions can substantially reduce landfill disposal and contribute to enhanced environmental protection and urban sustainability.

Key words: *Food waste, urban areas, waste management, legal restrictions, circular economy, sustainable solutions.*

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SELF - SUFFICIENCY IN CONTEMPORARY URBAN FOOD PRODUCTION

Branka Stipanović¹⁴³

Abstract

In light of increasingly serious challenges such as climate change, globalization, and urbanization, the importance of ensuring food security and sustainability becomes crucial for the future of societies. This paper explores the socio-economic and ecological benefits of contemporary initiatives for self-sustainable food production, particularly those that use short supply chains, urban agriculture, and community gardening. Through a meta-analysis of recent scientific literature, the study presents examples from various urban environments in Canada, the USA, and Europe. The results indicate that innovative models improve food availability, strengthen local economies, and contribute to reducing the ecological footprint. The results highlight the need to include self-sustaining programs in urban plans and policies to ensure long-term effects on socio-economic development and environmental protection. Contemporary models such as short supply chains and urban gardening provide sustainable alternatives that strengthen local economies and contribute to environmental preservation. The globalization of food systems increasingly depends on large suppliers and extended supply chains, which reduces the availability of fresh products and increases the ecological footprint due to fuel consumption and carbon emissions. Urban agriculture and short supply chains address these challenges by providing localized, sustainable food production systems. Community and urban gardens not only provide immediate access to fresh produce, but also encourage social inclusion and contribute to the creation of green spaces in cities, thereby improving the quality of life. Such gardens often include joint initiatives to promote agricultural production in communities with food shortages, thereby strengthening food security and reducing socioeconomic disparities. The study conducted a meta-analysis to provide a comprehensive assessment of the effects of self-sustaining programs on urban communities, examining their potential for further implementation in improving socio-economic and environmental living conditions and the economy.

Key words: *Climate change, urban agriculture and economy, sustainable development, short supply chains, ecological footprint.*

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ASSESSMENT OF RESPONDENTS' KNOWLEDGE ABOUT THE ORIGIN, PROPERTIES AND USES OF SWISS CHARD, BEETROOT AND SPINACH

Marta Čupić¹⁴⁴; Boris Dorbić¹⁴⁵; Emilija Friganović¹⁴⁶

Abstract

In the general part of this work, an overview of the nutritional and health values of vegetables is given, as well as the origin, morphological and biological properties, and nutritional and health values of swiss chard, beets and spinach with the main characteristics of processing and use. Vegetables are used fresh or processed. They are a source of biologically important substances: mineral substances, vitamin C, provitamin A, vitamin B1. In vegetables, the most common components of nutrients and phytonutrients are: dietary fibers, polyphenols, carotenoids, vitamin C, folates, calcium and selenium. Survey for this paper was conducted during April and May 2024. year on a sample of 51 respondents. Hypotheses about the respondents' knowledge about the origin, morphological-biological properties, nutritional value and impact on health, as well as the processing and use of Swiss chard, beets and spinach were partially confirmed. Based on the above, it is necessary through expert lectures, media, etc. improve the knowledge of the wider population about the nutritional and health values of Swiss chard, beets and spinach and popularize their greater use in daily meals.

Key words: *Swiss chard, beets and spinach, knowledge survey, nutritional and health value, morphological and biological properties, processing and use.*

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BIOPHYSICS IN THE SERVICE OF HEALTH AND ENVIRONMENTAL PROTECTION

Snežana Bećirić¹⁴⁷; Milica Gerasimović¹⁴⁸

Abstract

Biophysics is an interdisciplinary scientific field that integrates physics, biology, and medicine, aimed at applying physical principles to the understanding and analysis of biological systems. In a contemporary context, its role is increasingly significant in investigating the relationship between human health and environmental conditions, which is crucial for sustainable development. This paper provides an overview of key concepts and methods in biophysics, medicine, and ecology, emphasizing the importance of biophysical approaches in studying the impact of environmental factors on human health and their application in disease prevention and diagnosis. The results indicate that the biophysical approach enables quantitative investigation of environmental factors such as air and water pollution, ionizing and non-ionizing radiation, and nanoparticles at the molecular, cellular, and tissue levels. Modern methods, including biosensors, spectroscopic techniques, and biological system modeling, contribute to early risk detection and more effective diagnostic and protective strategies. The findings suggest that integrating biophysics with medicine and ecology improves understanding of disease mechanisms related to environmental factors and supports prevention, early detection, and overall quality of life.

Key words: *Biophysics, public health, environment, environmental factors, sustainable development.*

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FOOD FRAUD AND THE RISK OF ALLERGIC REACTIONS

Aleksandar Stevanović¹⁴⁹; Snežana Knežević¹⁵⁰

Abstract

Food fraud represents a problem with an estimated value of 40-50 billion USD annually, with a 300% increase in incidents during 2020-2024. This study analyzes allergic risks caused by food fraud and detection methods. PubMed, Web of Science, and Scopus databases were searched (2020-2025). Five product categories with significant allergic risk were identified. In seafood, species substitution rates reach 21-48%, with different parvalbumin profiles determining allergic risk. Dairy products show economically motivated milk type substitution (cow/sheep/goat), altering casein profiles and IgE reactivity. Olive oil adulteration with soybean oil (80%) endangers soy-allergic individuals. Meat products contain undeclared soy/gluten as fillers (68%). Detection methods include molecular techniques (DNA barcoding with an 88-99% success rate, PCR, NGS), proteomic analyses (ELISA, mass spectrometry), AI, blockchain, and spectroscopic methods. The literature identifies a critical gap: studies differentiating allergic reactions from intentional fraud versus unintentional errors or cross-contamination are lacking. Data for the Balkan region are also absent. Development of standardized protocols, reference databases, and integration of molecular methods with allergic risk assessment is needed to evaluate real public health risks. For countries in EU integration, the development of molecular food fraud detection methods integrated with epidemiological surveillance of allergic reactions is essential.

Key words: *Food fraud, allergic reactions, species substitution, food safety.*

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OCCUPATIONAL ALLERGIC RESPIRATORY DISEASES IN FOOD INDUSTRY WORKERS

Snežana Knežević¹⁵¹; Aleksandar Stevanović¹⁵²

Abstract

Occupational allergic respiratory diseases represent a significant health problem in the food industry, with a prevalence of 10-25% of asthma and rhinitis among exposed workers, reaching 36% in the seafood sector. The aim is to review occupational allergic respiratory diseases by food industry sectors, identify major allergens, and risk factors. PubMed, Scopus, and Web of Science databases were searched for 2020-2025, using the terms: occupational asthma, rhinitis, and food processing workers. Three high-risk sectors were identified. In the bakery, asthma prevalence is 4-13% and rhinitis 15-20%, with sensitization to wheat (64%), rye (52%), and α -amylase (21%). In seafood processing, asthma prevalence in shellfish reaches 4-36% and rhinitis 2-36%, with fish processing 2-8% for asthma. Major allergens are tropomyosin and parvalbumin. The dairy and meat industry reports asthma and rhinitis associated with sensitization to casein and latex. Atopy and smoking represent the main risk factors. The diagnostic algorithm includes spirometry, specific IgE measurement, skin prick tests, and inflammatory biomarkers (CCL20, IL-13). Preventive measures include exposure limits (<0.5 mg/m³ for flour), improved ventilation systems, and medical surveillance every 6-12 months. Recent therapeutic research indicates the efficacy of sublingual immunotherapy. Enhancement of worker health monitoring protocols and harmonization of exposure standards are necessary.

Key words: *Occupational asthma, food industry workers, allergens, respiratory allergy.*

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ENDOPARASITES OF DOGS IN CENTRAL BELGRADE MUNICIPALITIES – RESULTS OF A THIRTY YEAR STUDY (1993-2023)

Ivan Pavlović¹⁵³

Abstract

The constant increase in the number of dogs, strays and pets, represents a serious epidemiological and ecological problem of urban areas in the world and in our country. Dogs are carriers and hosts of a large number of zoonotic parasites species which eggs were eliminated by feces and contaminate public places and parks in urban areas and present a significant health problem from human. From this reason at Belgrade, we had parasitological research of public places continuously from 1993 to 2023. At same time we examined parasitic fauna of stray and pets' dog at same places where we collected soil and grass samples. Here we presented results of our thirty-year study (1993-2023) of endoparasites fauna of dogs in central Belgrade municipalities

Key words: *Dogs, endoparasites, epidemiology.*

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THE ROLE OF THE SANITARY-ENVIRONMENTAL TECHNICIAN IN ENVIRONMENTAL PRESERVATION AND PUBLIC HEALTH PROTECTION

Snežana Knežević¹⁵⁴; Aleksandar Stevanović¹⁵⁵

Abstract

The preservation and improvement of the environment are fundamental prerequisites for the protection of human health and are closely aligned with the principles of public health and environmental science. Contemporary challenges, including water, air, and soil pollution, inadequate waste management, and the emergence and spread of infectious diseases, necessitate an integrated approach combining preventive, control, and educational measures. This paper aims to examine the role and competencies of sanitary-environmental technicians in environmental protection and the safeguarding of public health. The study is based on an analysis of relevant scientific and professional literature, applicable regulatory frameworks, and competency standards defining this professional profile. The findings indicate that sanitary-environmental technicians play a significant role in assessing the safety and quality of water, food, and air through the application of physicochemical and microbiological methods. In addition, they are actively involved in implementing disinfection, disinsection, and deratization measures. Their work further contributes to the proper management of medical and municipal waste, as well as maintaining sanitary and hygienic conditions in occupational settings. The findings suggest that the competencies of sanitary-environmental technicians constitute an important factor in reducing public health risks and supporting environmental sustainability, in line with the principles of sustainable development.

Key words: *Public health, sanitary-environmental technician, environmental protection, hygiene and epidemiological control, sustainable development.*

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THE META-SCIENTIFIC ARCHITECTURE OF SPACE — A NEW PARADIGM OF INTEGRATED SPATIAL PLANNING

Marija Maksin¹⁵⁶; Vladica Ristić¹⁵⁷

Abstract

This paper introduces an innovative paradigm — the meta-scientific architecture of space — that redefines spatial planning as a process of reflexive intelligence rather than external control. Rooted in the convergence of epistemology, ecology, and technology, the concept proposes that space itself possesses cognitive potential, functioning as an intelligent system capable of perceiving, learning, and co-evolving with human and planetary processes. Through the case study of Belgrade, the research develops and applies the Meta-Spatial Integrative Index (MSII), a composite metric that quantifies spatial consciousness across four dimensions: epistemological density, ecological stability, technological connectivity, and reflexive capacity. Using a methodology that integrates GIS-AI analytics, digital twin simulations, and epistemological cartography, the study maps the city as a dynamic network of cognitive zones. Results reveal that the highest levels of spatial intelligence emerge at the intersection of knowledge clusters, ecological corridors, and digital infrastructures, forming a topological system analogous to a neural network. These findings demonstrate that cities can evolve into self-reflective organisms — entities that adapt, regenerate, and sustain themselves through feedback-driven learning. The meta-scientific framework thus transcends disciplinary and technological boundaries, positioning urban space as a biosphere of awareness and a foundational component of planetary intelligence. By bridging matter and consciousness, data and ethics, this approach establishes the groundwork for a reflexive civilization, where planning becomes a dialogue between human creativity and the living intelligence of the Earth.

Key words: *Meta-science, reflexive spatial intelligence; cognitive urbanism; epistemological cartography; ecological resilience; planetary intelligence.*

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CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION: CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

Irfan Ullah Stanikzai¹⁵⁸; Rafiuddin Shahid¹⁵⁹; Pooja Vasudeva¹⁶⁰

Abstract

The impact of climate change is ongoing, causing more severe natural disasters with no end in sight. These disasters threaten people, the modern world's constructed amenities, and economies. Planning ahead and preparing in advance in order to adapt to the impacts of climate change moves our civilization closer to the development of a more sustainable world. Planning and preparation must focus on the most vulnerable areas. For these areas, resilience must be built and strengthened in order to deal with the impacts of climate change and the decrease of the associated risks of disasters. These are terrible risks, have multidisciplinary working aspects, and are also areas of research and climate change. The focus of this research is to analyze the link between the impacts of the climate and the relief of the disasters to develop sustainable development. The research is based on quantitative, descriptive and analytical methods. Data has been collected through questionnaires distributed to 250 respondents, community members, environmental and disaster management experts. In the adaptation and disaster relief practices, the author will use descriptive, and regression, predictive correlational statistics to analyze and interpret the results. The research shows that the implementing the proposed climate change adaptation strategies results in a reduction of the adverse impacts of disasters, and a significant reduction in time to restore the impacted areas. Challenges include inadequate funding, insufficient awareness, and poor communication. The study demonstrates that the importance of climate change adaptation encompasses both reducing the risks associated with climate-related disasters as well as aiding the facilitation of sustainable development. The study also affirms that bolstering adaptive capacity may materially strengthen community resilience to climate change impacts.

Key words: *Climate change adaptation, disaster risk reduction, sustainable development, climate resilience.*

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HISTORIC ENVIRONMENTAL HAZARDS IN HIMACHAL PRADESH: LESSONS FOR SUSTAINABLE DEVELOPMENT

Meenakshi Thakur¹⁶¹; Shailja Vasudeva¹⁶²

Abstract

Himachal Pradesh, a mountainous region in India, faces a range of historic environmental hazards, including landslides, glacial lake outburst floods (GLOFs), and seismic events. This paper examines significant incidents, such as the 2000 Mandi landslide, the 2013 GLOF in the Bhagirathi basin, and the devastating 1905 Kangra earthquake. By analysing the causes, consequences, and responses to these events, the study highlights the vulnerability of local ecosystems and communities. The findings emphasize the urgent need for improved disaster management strategies, sustainable development practices, and community engagement in risk assessment. Ultimately, this research aims to inform future policies that enhance resilience against environmental hazards in Himachal Pradesh.

Key words: *Himachal Pradesh, environmental hazards, glacial lake outburst floods, Kangra earthquake, sustainable development, community resilience.*

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SPATIAL ORGANIZATION AND COGNITIVE-EMOTIONAL EXPERIENCE IN PEDIATRIC HEALTHCARE ENVIRONMENTS

Kristina Medić¹⁶³

Abstract

This study examines how spatial organization affects user behavior and cognitive-emotional experiences in pediatric healthcare environments. Conducted at the Institute for Mother and Child in Belgrade, the research employs non-participatory field observation and behavioral mapping to analyze movement flows, waiting patterns, and points of spatial confusion in entrance and main hall areas. Observations focused on interactions between children, caregivers, and medical staff, highlighting zones of congestion, overlapping circulation routes, and areas of increased stress. Findings indicate that unclear wayfinding, inconsistent visual hierarchy, and overlapping functional zones contribute to elevated cognitive load and emotional stress, particularly among caregivers. Children's exploratory behavior further complicates circulation, indirectly influencing caregiver stress. The study emphasizes the importance of intuitive spatial organization, clear visual cues, strategically placed seating and service counters, and acoustic management to enhance user experience. By integrating empirical observations with spatial analysis, this research provides actionable insights for evidence-based design interventions that improve circulation efficiency and reduce stress, ultimately supporting cognitive and emotional comfort for both patients and caregivers.

Key words: *Pediatric healthcare, spatial organization, cognitive-emotional experience, wayfinding, healthcare design.*

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APARTMENT LIFESPAN: FUNCTIONAL THRESHOLDS IN THE ORGANISATION OF RESIDENTIAL SPACE

Đorđe Alfirević¹⁶⁴; Sanja Simonović Alfirević¹⁶⁵

Abstract

Contemporary housing is most often evaluated through spatial and functional characteristics observed from a static perspective, without considering the changes that occur throughout the life cycle of a household. This paper introduces the concept of apartment lifespan as an indicator of the duration of the functional adequacy of an apartment's spatial organisation. The aim of the research is to establish a model for assessing how long an apartment can accommodate changing household needs without spatial adaptation. The methodology is based on linking the developmental phases of the household with a systematised classification of residential functions and testing seven selected apartments from New Belgrade (1965–1978) and on analysing changes in their intensity over time. Particular attention is given to critical functions whose spatial requirements change discontinuously, such as privacy, sleeping, reading and writing, storage, and contacts. Their interaction is examined through the concept of functional thresholds, defined as points at which the existing spatial organisation can no longer adequately support the evolving needs of users. The results indicate that the lifespan of an apartment depends not on the uniform presence of all residential functions, but on its capacity to respond to the clustering of critical functional thresholds in specific phases of household development. The proposed model provides an operational framework for evaluating the long-term usability of apartments and the sustainability of housing.

Key words: *Apartment lifespan, housing adaptability, residential functions, functional thresholds, spatial organisation, housing sustainability.*

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FROM TRANSYLVANIA TO PENNSYLVANIA: REFLECTIONS ON RURAL COMMUNITIES AND YOUTH ENGAGEMENT IN DESTINATION BRANDING PROJECTS

Florin Nechita¹⁶⁶; Kai Schafft¹⁶⁷

Abstract

Rural youth are essential to sustaining community vitality in the face of depopulation and outmigration. This study examines how young people can be engaged as leaders in sustainable development through the preservation and creative reuse of cultural heritage. Drawing on comparative fieldwork in Transylvania and Pennsylvania, it highlights how local heritage can drive local innovation, tourism, and identity, while also addressing barriers to youth participation and proposing inclusive, co-creative models of rural resilience. Using Transylvania Creative Camp (2016, 2023, 2025) at Transilvania University of Braşov as a case study, the paper explores how international and local high-school students developed communication and marketing skills through project-based learning (PBL). Participants collaborated with local stakeholders to promote Lăpuş Land, Romania, gaining practical experience in destination branding. Although conducted outside the formal curriculum, these initiatives demonstrate the value of integrating PBL into academic programs to foster interdisciplinary learning, enhance communication education, and support community-based tourism. Findings show that PBL strengthens collaborative leadership, critical thinking, and practical expertise. Insights from a Fulbright research stage at Penn State University, where youth researchers were supported and equipped to foster social and economic impact, further inform initiatives that empower rural youth to shape the future of their communities.

Key words: *Destination branding, rural youth, youth engagement, project-based learning, cultural heritage.*

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THE ROLE OF LOCAL COMMUNITY PARTICIPATION IN ECOTOURISM PLANNING AND DEVELOPMENT IN PROTECTED AREAS, WITH SPECIAL REFERENCE TO THE REPUBLIC OF SERBIA

*Nikola Kilibarda*¹⁶⁸

Abstract

Ecotourism, as a form of sustainable tourism, represents a bridge between economic development, environmental conservation, and cultural heritage preservation, with the aim of improving the quality of life of the local population. It emerged as a response to environmental degradation caused by mass tourism during the 1970s and 1980s, and today it constitutes an ethical imperative and a significant instrument of sustainable rural development. The particular importance of this form of tourism lies in its ability to simultaneously protect biodiversity and generate economic benefits for local communities in protected and rural areas. The aim of this paper is to analyze ecotourism – its definitions, emergence, development, and concept, the role of protected areas, with a special focus on the concept of ecological tourism in the Republic of Serbia and the importance of local community participation in its development. The paper highlights the role of protected areas (according to IUCN categorization and the Law on Environmental Protection of Republic of Serbia) and analyzes the participation of the local community in the planning and implementation of ecotourism, using examples from national parks. The results show that higher levels of participation significantly contribute to economic stability, conflict reduction, and better biodiversity protection.

Key words: *Ecotourism, protected areas, local community.*

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APPLICATION OF STRATEGIC MANAGEMENT IN TOURIST BUSINESS ENTITIES

Duško Laković¹⁶⁹

Abstract

In abrupt and sudden changes in the environment, it is only possible to partially predict the chances based on the research and creativity of the management team, which is why there is a change in the content of strategic management. Management systems based on flexible and quick response are being developed. Changes in the environment of organizations and the conditions under which many changes develop are too fast, so classic forecasting cannot be applied. In such levels of turbulence of the environment, where it is only possible to partially predict chances based on research and creativity, management team and concepts of strategic management play a very important role. This especially applies to tourist business entities, for which elements such as multivariate planning, strategic management using weak signals, and management of surprises are extremely important. The high levels of turbulence and complexity of the environment in which business entities have multiple intertwined relationships, while performing their business and wider social mission, require the selection of an adequate strategy.

Key words: *Strategic management, strategic planning, environment, changes, tourism.*

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ARTIFICIAL INTELLIGENCE IN TRANSPORT INFRASTRUCTURE ASSET MANAGEMENT: OPPORTUNITIES, RISKS AND IMPLEMENTATION CHALLENGES

Igor Jokanović¹⁷⁰; Branimir Zih¹⁷¹; Dušan Graovac¹⁷²; Nenad Dojčinović¹⁷³; Milica Pavić¹⁷⁴

Abstract

Transport infrastructure asset management is increasingly dependent on large volumes of condition, performance, and operational data collected through modern monitoring technologies. Traditional asset management approaches, largely based on deterministic deterioration models and periodic inspections, often struggle to fully exploit the growing availability of such data. Artificial Intelligence (AI) offers new possibilities for improving decision-making processes in infrastructure management by enabling advanced data analysis, predictive modelling, and automated detection of infrastructure defects. This paper will examine the potential applications of AI in transport infrastructure asset management, with particular focus on road and railway networks. At the same time, the paper will discuss several important risks and limitations associated with AI implementation, including data quality issues, lack of transparency in algorithmic decision-making, institutional capacity constraints, and potential overreliance on automated systems. The paper seeks to analyze the potential of artificial intelligence to enhance infrastructure asset management practices and the conditions necessary for its effective implementation, including reliable data, appropriate institutional frameworks, and integration with established engineering judgement and asset management principles.

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Key words: *Artificial intelligence, transport infrastructure, asset management, decision support, risks, challenges.*

ROLE OF TUNNELING IN ENVIRONMENTAL PROTECTION IN URBAN AREAS

Željko Žugić¹⁷⁵

Abstarct

Rapid urbanization places increasing pressure on surface land use, environmental quality, and infrastructure capacity. Tunneling provides a sustainable engineering solution by enabling the development of transportation networks and utility systems underground while preserving the urban surface environment. Underground construction reduces traffic congestion, noise, and air pollution by supporting high-capacity public transport systems and relocating high-impact infrastructure below ground level. Modern tunneling technologies, including mechanized excavation and advanced ground control methods, allow construction with limited disturbance to surrounding soil, groundwater conditions, and existing structures. Compared to open-cut excavation, tunneling significantly reduces impacts on green areas, cultural heritage sites, and densely populated zones. In addition, underground infrastructure improves urban resilience by protecting critical transport and utility systems from climate-related hazards such as flooding and extreme temperatures. From a sustainability perspective, tunneling contributes to long-term environmental benefits through reduced operational emissions, optimized land use, and support of low-carbon urban mobility. When combined with comprehensive environmental impact assessment and modern geotechnical design standards, tunneling represents a key tool for achieving sustainable and climate-resilient city development.

Key words: *Tunneling, redused impacts, environment benefits, urban area.*

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FEASIBILITY AND REGULATION OF URBAN AND RURAL AIR TRANSPORT BY DRONES

*Nikola Slavković¹⁷⁶, Ana Slavković¹⁷⁷, Svetozar Sofijanić¹⁷⁸,
Predrag Drobnjak¹⁷⁹, Đorđe Vranješ¹⁸⁰*

Abstract

The development of urban air mobility (UAM) represents a complex systems engineering challenge spanning multiple technical domains, including aircraft design, traffic management, and communication and navigation infrastructure. AI-based flight systems and adaptive routing algorithms continue to improve operational performance. This paper synthesized research on Unmanned Air Vehicles (UAV) applications in last-mile parcel delivery across various domains, including economic impacts, environmental performance, and routing optimization. From an economic standpoint, UAVs are reported to reduce delivery costs by up to 97% compared to traditional truck delivery, largely because human resource costs constitute 50-70% of total truck delivery costs, compared to only 6% for UAV-based delivery. On the regulatory side, authorities are advancing rulemaking to enable routine Beyond Visual Line of Sight (BVLOS) operations. BVLOS is currently used mainly in long-range medical or emergency supply runs, i.e. rural-health logistics, or remote inspections, where BVLOS decrease survey time and cost up to 50%, versus manned aircraft. This paper is also focused to the charging infrastructure costs, for drone-charging stations, hubs, energy-supply upgrades and ongoing energy costs (electricity tariffs, possible demand charges, and maintenance). In feasibility studies, main goal is to model infrastructure investment per node and per kWh to be limited, relative to the revenue or savings per delivery, so the planning drone transport is cost-effective.

Key words: *Delivery drones, routing optimization, economic impact.*

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PREDICTIVE MAINTENANCE USING IOT NETWORK FOR REDUCING COSTS IN AIR TRANSPORT

*Ana Slavković¹⁸¹, Nikola Slavković¹⁸², Svetozar Sofijanić¹⁸³,
Goran Zajić¹⁸⁴, Đorđe Vranješ¹⁸⁵*

Abstract

Predictive maintenance is the strategy that uses data collected in real time to predict when a failure will occur, before it actually occurs. Modern airplanes are equipped with several thousand of IoT sensors that are continuously measuring the state of the airplane's functionality parameters, both on the ground at rest or in the air during flight, takeoff and landing. Machine learning algorithms compare the current state with recorded data from previous flights, thereby identifying anomalies and patterns that precede failures and generating alerts and recommendations for technicians. IoT sensors on aircraft perform real-time condition monitoring and prevent major breakdowns before they happen and prioritize them with a precise timeline. It enables failure predictions 35-70 days ahead with about 95% accuracy. In this paper, the real-time data for proactive decisions, reducing delays and overall flight expenses were analyzed, using FFT (Fast Fourier Transform) analysis. Upgraded models with more than 24 channels per aircraft were proposed. They monitor engines, gearboxes, rotors, and wings effectively, and lead to the integration of new systems for monitoring the air transport process. By using LoRaWAN/NB-IoT wireless communications, battery-powered, long-range tracking with precise positioning is provided. Edge computing AI enables onboard anomaly detection which will further increase the safety of passengers and goods, and reduce overall costs.

Key words: *IoT network, air transport, security, costs.*

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THE EKO-WELL PROJECT: A LONGITUDIAL STUDY (2026-2030)

Ljiljana Kontic¹⁸⁶; Milena Jaksic¹⁸⁷; Violeta Domanovic¹⁸⁸

Abstract

This paper presents a preliminary results of the EKO-WELL longitudinal study for the first half of 2026. A results of the pilot study has been published (Kontic & Bracun). By leveraging an initial findings, the main aim is to expand preliminary research into a comprehensive assessment of how human-centric initiatives drives financial indicators in the Western Balkan countries. Practical contribution will be a framework for analyzing the correlations between employees' wellbeing and corporate sustainability at regional level. The Western Balkans region has been chosen. Representative sample used in this study. A mixed-method has been used. The case study method, content analysis, and semi-structured interviews for qualitative data. The quantitative data were processed by the Correspondence analysis. In 2026, preliminary results pointed to similarities or/and differences in employees' wellbeing in observed companies.

Key words: *Behavioural economics, employees' well-being, financial performances, correspondence analysis, Western Balkans.*

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INNOVATIVE METHODS AND TOOLS OF FINANCIAL MANAGEMENT IN THE FUNCTION OF LONG-TERM FINANCIAL STABILITY AND SUSTAINABILITY

Ismet Kalić¹⁸⁹; Nermina Čatić¹⁹⁰; Tarik Čatić¹⁹¹; Nermin Kalić¹⁹²; Belma Mešić¹⁹³;

Abstract

Rapid technological advancement and digital transformation have altered business conditions in the global economy, reflecting growing needs for redefining traditional approaches to financial management. The aim of this paper is to examine the role of innovative financial management methods and tools in ensuring long-term financial stability and sustainability of organizations. Methodologically, the paper is based on a review of relevant literature and a comparative analysis of contemporary financial management approaches. Modern financial management entails the integration of digital tools, artificial intelligence, and predictive analytics into the processes of planning, control, and business decision-making. Circularity principles are increasingly taking a central place in strategic financial management in response to growing demands for environmentally sustainable business practices. The results of the analysis indicate that the synergy of innovative methods, digital tools, and circularity principles represents a new paradigm of financial management that provides organizations with a competitive advantage and ensures long-term financial resilience.

Key words: *Innovative methods, modern tools, financial management, financial stability, sustainable development.*

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INTEREST AS THE ENGINE OF MODERNITY: LEGAL FOUNDATIONS, CULTURAL ORIGINS, AND FUTURE CONSEQUENCES

*Kazushi Yamamoto*¹⁹⁴

Abstract

I contend that interest, whilst operating within the legal architecture by which modern law and the state—through constitutional order—have fashioned the individual as a political person distinct from the family, nonetheless performs an indispensable function that the law alone cannot fulfil: it lubricates the leap into uncertain futures. Modern polity demands the legal recognition of persons; yet epochal transformation frequently depends upon motivational and material forces that transcend statutory form. Interest, by mitigating the psychological and economic frictions attendant upon bold innovation, renders practicable the visionary ventures that propel societies forward. For projects oriented toward a conceived future, interest eases the requisite “jump” into novel institutions and technologies, even as venerable philosophical and theological critiques—from Aristotle and Thomas Aquinas to strands of Catholic and Islamic thought—continue to question its moral warrant. Historically, the endorsement of interest within modern economic discourse found particular resonance in London, and may be regarded as one of the formative causes behind the impetus for founding institutions such as the University of London and the emergence of a public sphere in Britain associated with figures like Jeremy Bentham. Analogous financial practices are observable in Japan as far back as the Edo period. Contemporary tensions persist: Islamic finance formally proscribes interest, while emergent technologies such as blockchain suggest mechanisms that may constrain monetary expansion; yet interest has long been regarded as a driver of growth. By synthesising legal, historical, ethical, and technological perspectives, this essay elucidates how interest mediates continuity and change and offers implications for financial regulation, ethical finance, and innovation policy. Recognising interest as both an economic instrument and a cultural technology illuminates debates that will shape not only the twenty-first century but a more inventive and alluring twenty-second century.

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Key words: *Interest; modernity; jump into the Future (a neologism coined by the present author), legal personhood; islamic finance; Blockchain; economic ethics.*

PERSPECTIVES OF THE REPUBLIC OF SERBIA IN THE EUROPEAN ECONOMY

Slavko Vukša¹⁹⁵; Sergej Vukša¹⁹⁶, Zeljko Brnjica¹⁹⁷

Abstract

In recent decades, significant changes have occurred in the global economy. The insufficient adaptation of the Serbian economy to these changes and inadequate resource utilization have led to a deep economic crisis in which Serbia currently finds itself. To exit this crisis, Serbia must develop a concept of sustainable development, which implies meeting the needs of current generations in a way that will also allow future generations to meet their own needs. The current situation requires quick and concrete measures such as attracting foreign direct investments, tax incentives, and stimulating exports through economic growth. Additionally, it is essential to complete the privatization process and redirect the focus to the small and medium-sized enterprise sector, which should become the engine of our country's development. However, a more comprehensive recovery of the Serbian economy in the long term will not be possible without a fundamental restructuring and integration into new economic flows. Therefore, Serbia should invest in the development of infrastructure and human resources, which are key factors for long-term development and reducing unemployment, as well as aligning with European and global standards in all areas. In its further development, we must be aware that the arrival of foreign investments cannot solve all problems, and that alongside attracting them, we must invest in our own potentials. When it comes to technological development, foreign countries must remain our main source of supply, but investments should be made to increase absorption capacity so that the technology we import is used correctly.

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Key words: *Serbia, recession, competitiveness, foreign investment, development model*

METADISCIPLINARITY OF INDUSTRY X.0 – THE EPISTEMOLOGY OF THE INTELLIGENT SYNTHESIS OF SCIENCE, TECHNOLOGY, AND CONSCIOUSNESS

Vladimir Tomašević¹⁹⁸

Abstract

Industry X.0 (X.0) fuses cyber-physical systems, AI, and ubiquitous sensing into production networks that learn, anticipate, and adapt. Yet most integration efforts remain multi- or transdisciplinary: they combine fields without reorganizing how knowledge itself is produced. This paper proposes metadisciplinarity for X.0—an epistemic upgrade in which manufacturing systems do not merely integrate disciplines but reshape their inner grammar: how problems are framed, evidence is validated, and ethics is encoded in algorithms and governance. We formalize a lightweight set of indices (for value-alignment, ecological performance, and knowledge fusion), outline a reflexive pipeline for *human-in-the-loop* AI, and show how metadisciplinarity clarifies the shift toward (human-centric, resilient, and sustainable). The argument is anchored in recent reviews of AI-enabled manufacturing, sustainability in X.0, and human-centric X.0. Results suggest that organizations adopting metadisciplinary metrics and governance achieve more explainable AI, higher ecological performance, and better alignment of human expertise and machine intelligence—key prerequisites for trustworthy, regenerative production.

Key words: *Metadisciplinarity, industry 4.0 and 5.0, epistemology of technology, sustainability metrics, cyber-physical systems.*

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GREEN MARKETING AS A META-PLATFORM OF ECOLOGICAL ENTREPRENEURSHIP

Dragan Novaković¹⁹⁹; Vladica Ristić²⁰⁰

Abstract

Contemporary market change can no longer be explained through strict separations between economy, society, and ecology, as marketing has evolved from a promotional tool into a governance function that shapes sustainable market ecosystems. This paper develops the concept of a green marketing meta-platform—an integrative architecture that connects market actors, digital infrastructures, and socio-ecological values to support sustainability transitions. The framework is theoretically anchored by synthesizing the Natural-Resource-Based View, Service-Dominant Logic, Shared Value Theory, and Sustainable Marketing Orientation into a higher-order lens that positions marketing as connective infrastructure translating sustainability knowledge into market practices. Addressing a key gap in the literature, the model explains how green marketing structurally mediates interactions among: ecological entrepreneurship and value creation; digital technologies enabling transparency, traceability, and co-creation; and societal expectations shaping sustainable consumption and brand legitimacy. Methodologically, the study applies an integrative conceptual approach based on interdisciplinary theory synthesis and interpretation of emerging digital sustainability practices, including blockchain traceability, digital product identities, and participatory branding platforms. The paper differentiates the meta-platform from existing approaches by emphasizing marketing's infrastructural role in orchestrating multi-stakeholder innovation ecosystems rather than focusing solely on firm capabilities, strategy, or relational value co-creation. Finally, it outlines pathways for empirical operationalization through research on digital traceability in circular supply chains, co-creation platforms for sustainable design, and brand ecosystems as knowledge hubs for collaborative innovation.

Key words: *Green marketing; meta-platform; ecological entrepreneurship; sustainable marketing orientation; sustainability transitions.*

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THE ROLE OF ORM INHERITANCE STRATEGIES IN THE UTILITY'S LOGISTICS INFORMATION SYSTEM

Slavimir Vesic²⁰¹

Abstract

Logistics business processes play a very important role in the business of utility companies. The construction, operational and investment maintenance of city infrastructure is a complex and continuous process that involves the use of various types of vehicles and machinery. Therefore, the goal of utility companies is to manage their vehicle fleets as efficiently as possible and therefore use logistics IS. When designing, from the aspect of conceptual modeling, the principle of generalization and specialization can be applied to organize the classification of different types of vehicles. If an object-oriented programming language is used for the development of logistics IS, then it can present the mentioned concepts well enough. A large number of enterprise information systems use RDBMS, so the use of ORM technology is very common. In this manuscript, we will present ORM inheritance strategies for connecting object-oriented programming language classes and tables in the database when it is necessary to have a hierarchy with greater inheritance depth. We used the following technologies for implementation: .NET, C#, SQL Server, and Entity Framework Core.

Key words: *Logistic information system, utility infrastructure, ORM, inheritance strategies, object-oriented programming.*

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TOWARD A CONTEMPORARY FRAMEWORK OF INTERCULTURAL MANAGEMENT: CULTURAL INTELLIGENCE AS A STRATEGIC CAPABILITY IN MODERN ORGANIZATIONS

Ana Jurčić²⁰²; Milena Cvjetković²⁰³

Abstract

In contemporary organizational environments shaped by globalization and digital transformation, managing cultural diversity has become increasingly complex. Traditional approaches to intercultural management, primarily focused on individual competencies, appear insufficient for addressing the demands of modern organizations. This paper aims to reconsider the role of cultural intelligence (CQ) by positioning it as a strategic organizational capability rather than solely an individual attribute. The study adopts a qualitative, theoretical review approach, synthesizing existing literature on intercultural management, cultural intelligence, and contemporary organizational challenges. Through critical analysis, the paper identifies key limitations of prevailing models and highlights the growing relevance of CQ in managing multicultural teams, facilitating communication, and supporting organizational adaptability in contemporary organizational contexts marked by increasing digitalization. The findings suggest that cultural intelligence should be understood as an integrative capability embedded within organizational processes and practices. By proposing a contemporary conceptual framework, the paper contributes to the ongoing discussion on redefining intercultural management in line with current global and technological developments.

Key words: *Intercultural management, cultural intelligence (CQ), strategic capability, contemporary organizations.*

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DIGITAL TRANSFORMATION: TRANSFORMING THE PRODUCTION SYSTEM FROM A PIPELINE TO AN ECOSYSTEM MODEL

Joško Lozić²⁰⁴

Abstract

Digital transformation is a process that is part of modern business practice in all forms and types of organizations. The aim of this paper is to determine the fundamental factors associated with digital transformation processes and to analyse digital transformation models of different business models. The paper defines the fundamental differences in the approach to digital transformation according to organizational forms and the development of different forms of business systems. The monetization of goods and services is a key factor in determining different models of digital transformation. Classical organizations from production capitalism underwent a business transformation from a single and indivisible pipeline model to a platform economy model using the effects of digital transformation. Digital platforms established as digital infrastructure did not go through a developed phase and immediately began operating in some form of digital transformation of production systems. The third form of organization was initially established as a digital platform but subsequently developed some forms of the classical pipeline model.

Key words: *Digitization, digital transformation, ecosystem, platform economy, pipeline system.*

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REGULATORY, TECHNOLOGICAL AND SECURITY CHALLENGES

Mirna Kovačić²⁰⁵

Abstract

The rapid development of digital markets has significantly transformed the ways in which personal data are collected, processed, and used, raising complex challenges for privacy policy and data protection. This paper examines the relationship between digital markets and privacy policy through a systematic literature review, focusing on regulatory, technological, and security challenges in the context of the General Data Protection Regulation (GDPR). The study uses a qualitative methodological approach and systematically analyses scientific literature published between 2018 and 2024. The findings show that digital markets increasingly rely on personal data as a key resource, enabling personalised services and data-driven decision-making. However, this creates tensions between economic interests and the right to privacy. The implementation of GDPR has improved transparency, user rights, and accountability, but also presents challenges for organisations, particularly regarding compliance, costs, and technical complexity.

Key words: *Digital markets, privacy policy, General Data Protection Regulation (GDPR), data protection, information security, systematic literature review.*

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REASSESSING NATIONAL SECURITY: MODERN CHALLENGES, RISKS, AND THREATS

Shailja Vasudeva²⁰⁶; Richa Ranjan²⁰⁷

Abstract

In the contemporary global landscape marked by uncertainty and rapid change, national security is confronted with a wide spectrum of complex concerns that require precise conceptual clarity. Terms such as challenges, risks, and threats are frequently used in security discourse, yet they are often misunderstood or used interchangeably. Despite being collectively referred to under the framework of SCRT (Security Challenges, Risks, and Threats), each concept carries a distinct meaning and analytical significance in evaluating potential dangers to a nation's stability and strategic interests. This paper seeks to distinguish clearly between these categories and demonstrates how their misinterpretation can result in ineffective or misdirected policy responses. Adopting a sectoral approach informed by the Copenhagen School's framework, the study analyzes how security concerns manifest across multiple domains, including political, military, economic, societal, environmental, and informational sectors. It contends that an effective national security strategy depends not only on the accurate identification of these elements but also on recognizing their interrelated nature. Furthermore, the paper highlights the role of *risk* as a quantifiable concept, emphasizing its importance in enabling more systematic, evidence-based approaches to security planning and decision-making. By improving the classification and understanding of emerging security concerns, this study contributes to strengthening both the theoretical discourse and practical strategies within the field of national security.

Key words: *Challenge, national security, policy, risk, security strategy threat.*

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SKY ECC AS A TEST OF MODERN EUROPEAN CYBER SECURITY: MASS SURVEILLANCE AND THE LIMITS OF THE RIGHT TO PRIVACY IN THE DIGITAL ERA

Olgica Vulević²⁰⁸

Abstract

Based on the fact that encrypted communication systems were originally developed to protect user privacy, the paper examines how the intervention of state authorities in the functioning of the encrypted application Sky ECC led to the mass collection of communication data and possible violation of basic human rights and freedoms. The paper defines the concept of mass surveillance and the justification of its application. The aim of the paper is to determine whether the Sky ECC precedent represents a justified limitation of the right to privacy to protect national security, or whether this platform is just an example of excessive mass surveillance that can threaten the foundations of democratic values. The paper will review the importance of international cooperation in the implementation of operations in the field of cyber security, with the aim of assessing its contribution to the efficiency and coordination of security activities in the digital space. The paper will apply a normative method for the analysis of relevant European and national legal sources that regulate the right to privacy and secrecy of communications, a method of judicial practice analysis, with special reference to the practice of the European Court of Human Rights and national courts in connection with mass surveillance and Sky ECC evidence, a comparative method.

Key words: *SKY ECC platform, mass surveillance, right to privacy, international cooperation, digital era.*

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ON TRUTH, SOCIETY AND THE WORLD

Josip Jambrač²⁰⁹

Abstract

The victory of liberalism did not mark *the end of history*, nor did it extinguish any hope that there was an alternative. What has become extremely visible as a result of this *failure* is the nightmare of intertwined short-term interests and imperatives within which the search for human well-being does not find its place. Transition countries have entered the democratic world at a time of growing scepticism about the values of democracy, declining trust in institutions, and the global popularity of authoritarian leaders. Understanding that the idea of (political) truth is linked to pluralism and political judgments, we accept that there is no single *truth* from a single centre of power. For the effective functioning of democracy and the prosperity of society, democracy requires citizens to speak the truth to their political elites. Who should question, deliberate, speak, write and demand a public debate about the future of Human and the world? How to stimulate public debate on the real achievements of public policies in a society that does not promote accountability, does not respect the epistemic infrastructure necessary for the progress of democracy? Can intellectuals try again to save European society? it should not be only individual mission.

Key words: *Truth, society, human, world, democracy, intellectual, h*

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STATE AND PERSPECTIVES OF SERBIA'S DEFENSE INDUSTRY IN THE GLOBAL SECURITY CONTEXT

Vlado Radić²¹⁰; Nikola Radić²¹¹

Abstract

The defense industry of the Republic of Serbia represents a respectable national capacity whose development role is twofold: permanent increase in exports and ensuring the necessary national self-sufficiency for the needs of the defense system. In addition, this branch of industry has the potential to develop at a high growth rate, which is based on decades of tradition and experience in the production of weapons and military equipment, high product quality, price competitiveness, specific knowledge and great interest of foreign buyers. The export strategy is based on successfully realized export projects and arrangements around the world, as well as establishing connections with existing and new customers. However, the export of weapons from Serbian defense industry companies in the past four years has been burdened by global security problems, such as war events in Ukraine, the Gaza Strip, regional conflicts in Africa and Asia, etc. Currently, Serbian defense industry companies are in an unenviable position because they cannot export their products. The state's decision to temporarily suspend the export of weapons and military equipment in the middle of 2025 led to the interruption of production, supply chains, inability to deliver pre-paid quantities of products, as well as delays in the payment of wages to employees. All of this represents a serious risk for the survival of the mentioned companies, because foreign exchange inflows from sales are the guarantor of the employment of capacities and the continuation of work. Every missed opportunity is used by the competition to enter the discerning market, so the absence or pause in deliveries causes negative consequences.

Key words: *Defense industry of Serbia, export, foreign exchange inflow, risk, survival.*

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INDIA'S NATIONAL SECURITY CHALLENGES IN THE 21ST CENTURY: EMERGING THREATS AND STRATEGIC RESPONSES

Kottai Rajan²¹²; Shailja Vasudeva²¹³

Abstract

National security has become increasingly complex in the twenty-first century due to the emergence of multidimensional threats arising from geopolitical transformations, technological advancements, and non-traditional security concerns.¹ As a major regional power with expanding global interests, India faces a wide spectrum of security challenges that extend beyond conventional military threats. This study examines the evolving nature of India's national security challenges in the twenty-first century, with particular emphasis on both traditional and emerging threats. The research analyzes key external security concerns such as border disputes, regional geopolitical rivalries, and cross-border terrorism,² as well as internal security issues including insurgency, extremism, and socio-political instability.³ In addition, the paper explores non-traditional security threats such as cyber warfare, maritime security risks, energy insecurity, climate change, and the implications of technological warfare.⁴ The study employs a qualitative and analytical methodology based on secondary sources, including scholarly literature, policy documents, government reports, and strategic analyses. The findings suggest that India's security environment is shaped by the convergence of traditional military challenges and emerging non-conventional threats, requiring a comprehensive and adaptive national security strategy. Strengthening defence capabilities, enhancing intelligence coordination, promoting regional cooperation, and integrating technological innovation into security frameworks are identified as critical components of an effective response.⁵ Furthermore, the study highlights the importance of diplomatic engagement, economic resilience, and institutional reforms in ensuring long-term national security.

The paper concludes that addressing India's national security challenges in the twenty-first century requires a holistic and multidimensional approach that integrates military preparedness, strategic diplomacy, technological advancement,

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and internal stability. Such an approach is essential for safeguarding India's sovereignty, maintaining regional stability, and securing its strategic interests in an increasingly uncertain global security landscape.

Key words: *National security, emerging threats, strategic responses, geopolitics, cyber security, terrorism, internal security.*



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STRATEGIC AMBIGUITY AND NATIONAL SECURITY IN THE TAIWAN STRAIT: RISKS, DETERRENCE, AND CONFLICT PREVENTION

*Mia Velkovska*²¹⁴

Abstract

The Taiwan Strait has emerged as one of the most sensitive security flashpoints in contemporary international relations. This paper examines the role of strategic ambiguity in shaping national security dynamics, deterrence, and the risk of conflict escalation between China, Taiwan, and the United States. The objective of the research is to assess whether strategic ambiguity continues to function as a mechanism of stability or increasingly contributes to uncertainty and insecurity. The study applies a qualitative methodology based on the analysis of policy documents, strategic statements, and academic literature. The findings indicate that although strategic ambiguity has historically supported deterrence, shifting power relations and rising tensions have weakened its stabilizing effect. The paper concludes that effective conflict prevention requires a balance between credible deterrence, diplomatic communication, and crisis-management mechanisms.

Key words: *Taiwan Strait, strategic ambiguity, national security, deterrence, China, conflict prevention.*

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INTERNATIONAL PUBLIC LAW IN CURRENT GLOBAL RELATIONS

Azim Uddin Gazi²¹⁵; Shailja Vasudeva²¹⁶

Abstract

International public law, also known as public international law, sets the legal rules that guide states, international organizations, and individuals in the world arena. These rules, anchored in treaties, customary law, and general principles, enable cooperation, resolve disputes, and impose accountability. Today, international public law faces opportunities and challenges as globalization increases the interdependence of nations. One of the most pressing issues is the tension between state sovereignty and collective global responsibilities. While sovereignty remains a cornerstone of international law, transnational challenges such as the Ukraine vs. Russia war, Israel and US vs Iran war, Venezuela invasion, climate change, pandemics, and cyber threats demand cooperative legal frameworks that transcend borders. Institutions such as the United Nations, the International Court of Justice, and specialized agencies play crucial roles in mediating these tensions, but often fail due to a lack of international law implications, as well as the preeminence of veto-wielding members over others. Although their effectiveness and legal norms are often questioned due to political divisions among member states. Another key dimension is the protection of human rights and humanitarian law. International public law has expanded to regulate not only inter-state relations but also the treatment of individuals, particularly in contexts of armed conflict, migration, and global justice. The rise of international criminal tribunals and the International Criminal Court reflects this shift toward accountability beyond the state level. Furthermore, global governance and legitimacy are central debates. Scholars argue for a paradigm shift toward “international public law” that emphasizes the pursuit of public interests by international institutions, aligning legal frameworks with world public opinion and democratic legitimacy. This evolution underscores the need for law to adapt to the realities of multipolar geopolitics and the growing influence of non-state actors. In conclusion, international public law remains indispensable in managing global relations, but its future depends on

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reconciling sovereignty with collective action, strengthening institutional legitimacy, and ensuring equitable participation in global decision-making. As challenges mount, the adaptability and resilience of international public law will determine its relevance in fostering peace, justice, and sustainable development.

Key words: *International public law, sovereignty, global governance, human rights, legitimacy, multipolarity.*



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INTERNATIONAL PUBLIC LAW IN CURRENT GLOBAL RELATIONS: NATIONAL SECURITY AND MODERN SECURITY FOR INDIA AND BANGLADESH.

Shailja Vasudeva²¹⁷; Azim Uddin Gazi²¹⁸

Abstract

International public law has become increasingly significant in shaping the security frameworks of South Asia, particularly for India and Bangladesh. While sovereignty remains a foundational principle, both nations face evolving challenges that demand cooperative legal and institutional responses. Traditional notions of national security — centered on territorial integrity, defense, and state sovereignty — are now complemented by modern security concerns such as cyber threats, climate change, transnational terrorism, and migration. These issues transcend borders and require collective action within the framework of international law. For India, international public law plays a role in balancing its strategic autonomy with obligations under global treaties on nuclear non-proliferation, counter-terrorism, and maritime security. Bangladesh, meanwhile, relies on international legal mechanisms to address vulnerabilities such as climate-induced displacement, cross-border water disputes, and human rights protections for migrants and refugees. Both countries engage with institutions like the United Nations, the International Court of Justice, and regional organizations to reconcile sovereignty with collective responsibility. This paper argues that the adaptability of international public law is crucial for managing the intersection of national and modern security in South Asia. By strengthening institutional legitimacy, fostering equitable participation, and embracing cooperative frameworks, India and Bangladesh can better navigate the complexities of global interdependence while safeguarding their national interests.

Key words: *International public law, national security, modern security, India, Bangladesh, sovereignty, collective responsibility.*

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CRISIS COMMUNICATION AND MANAGERIAL RESPONSIBILITY: KEY CHALLENGES AND DIRECTIONS

Aleksandar Dejanović²¹⁹; Jelena Lukić Nikolić²²⁰

Abstract

Crisis communication constitutes one of the core functions of public relations, as it directly influences reputation, legitimacy, and the long-term sustainability of organizations. This paper analyses theoretical approaches to crisis management and crisis communication, with particular emphasis on the managerial perspective. Typical managerial mistakes such as ignoring early warning signs, passivity, poor decision-making, and lack of transparency were discussed as factors that can accelerate organizational failure during crisis. In addition to identifying these weaknesses, the paper offered recommendations for strengthening managerial crisis communication through a holistic approach encompassing preparation, acute response, and post-crisis recovery. Theoretical models such as Situational Crisis Communication Theory (SCCT), which highlights the perception of responsibility as the key criterion for selecting communication strategies, were examined to provide a systematic framework. The findings demonstrate that transparency, open communication, and a clearly defined crisis plan significantly enhance organizational resilience and reinforce public trust. Crisis communication should be conceptualized not merely as a defensive tool for safeguarding organizational reputation, but as a strategic instrument that facilitates organizational adaptation, transformation, and ultimately survival under conditions of crisis.

Key words: *Crisis management, public relations, crisis communication, managers, organizational behavior.*

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PSYCHIATRIC ASPECTS OF ENERGY SECURITY: COLLECTIVE ANXIETY, RISK PERCEPTION AND SECURITISATION WITHIN THE EUROPEAN REGIONAL SECURITY COMPLEX

Anita Milanovic²²¹

Abstract

This paper examines the psychiatric dimensions of energy security within the European regional security complex, with particular emphasis on collective anxiety, fear, and risk perception related to the European Union's dependence on Russian natural gas. The objective is to analyse how securitisation processes transform energy dependence into a perceived existential threat, shaping both public perception and decision-making. The study employs an interdisciplinary qualitative approach, integrating security studies with psychiatric and forensic-psychiatric perspectives on collective behaviour and crisis decision-making, based on the analysis of relevant literature, policy documents, and key crisis events, including the gas disruptions of 2006 and 2009. The findings indicate that energy insecurity generates heightened collective anxiety and fear, leading to risk amplification and influencing political narratives, while psychological mechanisms such as uncertainty and threat perception affect the behaviour and judgments of political actors. The paper concludes that psychiatric factors significantly shape security policies and highlights the importance of integrating psychological insights into energy security analysis.

Key words: *Energy security, collective anxiety, risk perception, securitisation, psychiatric aspects, crisis decision-making.*

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